



Project No. 1251-100
Crude Oil Tank Farms Project, Agrood Area 30 (Module-1)

Enppi



EGPC

System ID

030-EL-020

System
Description

Electrical Power Module-4 System

Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
1	Mechanical Completion Certificate (MCC)	
2	Ready for Startup Certificate (RFSU)	
3	System Punch Lists	
4	System Limits Marked Up P&ID	
5	System Index	
6	Piping Pre-Commissioning	
	6.01) Piping Test Packs	
	6.02) Piping Pre-commissioning Check Lists	
7	Piping Commissioning	
	7.01) Service Test, GLT, CLT and N2 Purging Certificates	
	7.02) Piping Commissioning Check Lists	
Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
8	Mechanical Pre-Commissioning	
	8.01) System Mechanical Index	
	8.02) Equipment Drawings	
	8.03) Equipment Datasheets	
	8.04) Boxing-up Certificates	

	8.05) Grouting Certificates	
	8.06) Pre-Alignment Certificates	
	8.07) Mechanical Pre-Commissioning Checklists	
9	Mechanical Commissioning	
	9.01) Final Alignment Certificates	
	9.02) Motor Solo Run Certificates	
	9.03) Mechanical Run Test (MRT) Certificates	
	9.04) Mechanical Commissioning Checklists	
	9.05) Mechanical Supplier Check Lists & Reports	
10	Instrumentation Pre-Commissioning	
	10.01) System Instrument Index	
	10.02) Instrument Data Sheets	
	10.03) Instrument Cable Schedule	
	10.04) System Instrumentation Wiring Diagram	
	10.05) Hook-up Drawing (Mechanical & Pneumatic)	
	10.06) Instruments Cables Schedule	
	10.07) Instruments Cables Laying Certificates	
	10.08) Instruments Cables Termination Certificates	
	10.09) Instruments Cables Testing Certificates	
	10.10) Instruments Calibration Certificates	
	10.11) Instrument Loop Checks Certificates	
	10.12) Instrumentation Pre-Commissioning Check Lists	
	10.13) Instrumentation Supplier Check Lists & Reports	
11	Instrumentation Commissioning	
	11.01) Instrumentation Function Test Certificates	
	11.02) Instrumentation Supplier Check Lists & Reports	
Sr.	Pre-Commissioning and Commissioning Dossier Index	Applicable (Yes/No)
12	Electrical Pre-Commissioning	
	12.01) System Electrical Index	
	12.02) Electrical Drawings	
	12.03) Motor Datasheets	
	12.04) Electrical Cables Schedule	
	12.05) Electrical Cables Laying Certificates	
	12.06) Electrical Cables Testing Certificates	
	12.07) Electrical Cables Termination Certificates	
	12.08) FAT Reports & Certificates	
	12.09) SAT Reports & Certificates	
	12.10) Electrical Pre-Commissioning Check Lists	
	12.11) Electrical Supplier Check Lists & Reports	

13	Electrical Commissioning	
	13.01) Electrical -Commissioning Check Lists	
	13.02) Electrical Supplier Check Lists & Reports	
14	Red Marked-up Drawings	
	14.01) P&ID	
	14.02) Instrumentation Drawings	
	14.03) Electrical Drawings	



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

1-Mechanical Completion Certificate (MCC)



SYSTEM MECHANICAL COMPLETION CERTIFICATE (MCC)

PROJECT TITLE : CRUDE OIL TANK FARM PROJECT (AGROOD AREA)

PROJECT No : 01251-100



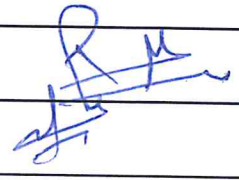
SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

THIS IS TO CERTIFY THAT:

- THE ABOVE SYSTEM HAS BEEN FABRICATED, ERECTED, INSTALLED AND TESTED TO THE REQUIREMENTS OF THE CONTRACT DRAWINGS, SPECIFICATIONS, THE APPLICABLE CODES AND STANDARDS.
- ALL PRE-COMMISSIONING RELEVANT ACTIVITIES, TESTS, INSPECTIONS AND CHECKS HAVE BEEN CARRIED OUT FOR THIS SYSTEM AND FOUND ACCEPTABLE.
- Q/C DOCUMENTATION OF THE ABOVE SYSTEM HAS BEEN AUDITED BY THE CUSTOMER SITE QUALITY CONTROL AND FOUND COMPLETED.
- ALL PUNCH LIST ITEMS CATEGORY (A) IN THIS SUBSYSTEM WERE CLEARED.
- THIS SYSTEM IS MECHANICALLY COMPLETED ON THE DATE AND READY FOR COMMISSIONING (RFC) WITH THE FOLLOWING EXCEPTIONS.

EXCEPTIONS :

COMPANY	PETROJET	ENPPI	PMC
NAME	AMIN TAHA		
TITLE	E&I Engg.		
SIGNATURE			
DATE	30/6/2021		



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

2- Ready for Startup Certificate (RFSU)

READY FOR START UP CERTIFICATE

PROJECT TITLE : EGPC CRUDE OIL TANK FARMS PROJECT (AGROOD-02)

PROJECT No. : 1251-100


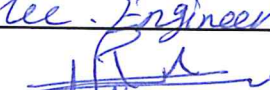
SYSTEM /AREA /PLANT : Electrical Power Module-4 System

SYSTEM /AREA /PLANT No. : 030-EL-020

THIS IS TO CERTIFY THAT:

- THE MENTIONED SYSTEM /AREA /PLANT IS READY FOR START UP WHERE ALL MECHANICAL WORKS, PRECOMMISSIONING AND COMMISSIONING ACTIVITIES HAVE BEEN SUCCESSFULLY COMPLETED.
- MECHANICAL COMPLETION CERTIFICATE(S) FOR THE MENTIONED SYSTEM / AREA / PLANT HAVE BEEN SIGNED.
- ISSUANCE OF THIS READY FOR START UP CERTIFICATE(S) SHALL NOT RELIEVE CONTRACTOR(S) FROM THEIR OBLIGATIONS TO COMPLETE THE REMAINING SYSTEMS NOR FROM THEIR WARRANTY OBLIGATIONS AND OTHER PROVISIONS OF THE CONTRACT.
- THE FOLLOWING EXCEPTIONS AGREED TO BE CLEARED AFTER START UP AND WILL NOT PREVENT START UP ACTIVITIES.

EXCEPTIONS :

COMPANY	CONSORTIUM	PPC
NAME	Ahmed El Shafie	Mohamed Ibrahim
TITLE	Commissioning Manager	Elec. Engineer
SIGNATURE		
DATE	13-7-2021	13-7-2021



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

3- System Punch Lists

PUNCH LIST

PROJECT TITLE : CRUDE OIL TANK FARM(AGROOD AREA)

PROJECT NUMBER : 1251-100

DISCIPLINE :

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-20

SUB-SYSTEM NAME :

SUB-SYSTEM ID :

No	DESCRIPTION	CAT	ACTION BY	DISP	CLEARANCE APPROVED BY
1	Earthing to be Installed and tested	A	PTJ	Elec	<i>[Signature]</i>
2	Cable trays covers to be installed Canal	B	PTJ	Elec	<i>[Signature]</i>
3	Met for medium Voltage Cable and Fire Cable to be Installed	R	PTJ	Elec	<i>[Signature]</i>
4	Earthing bits to be Installed	C	PTJ	Elec	<i>[Signature]</i>
5	Lightning system to be Connected to the earthing system	A	PTJ	Elec	<i>[Signature]</i>
6	S.S tags for all cables	C	PTJ	Elec	<i>[Signature]</i>
7	MV cable bind Connection to GPM/TR	B	PTJ	Elec	<i>[Signature]</i>
8	Stairs FDN to be don & bind Rackling & leveling	C	PTJ	clld	<i>[Signature]</i>

CAT: CATEGORY (A,B,C) , ACTION BY: (ENPPI, CONST. CONTRACTOR, SUPPLIER...), DISP: DISCIPLINE (PIP, MECH, ELECT, INST...)

COMPANY	PETROJET	ENPPI	<i>[Signature]</i> pme
NAME	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
SIGNATURE	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
DATE	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

4- System Limits Marked Up P&ID

System ID	030-EL-020
System Description	Electrical Power Module-4 System

5- System Index

System ID	030-EL-020
System Description	Electrical Power Module-4 System

6- Piping Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

6.01- Piping Test Packs



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

6.02- Piping Pre-commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

7- Piping Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

7.01- Service Test, GLT, CLT and N2 Purging Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

7.02- Piping Commissioning Check Lists

System ID	030-EL-020
System Description	Electrical Power Module-4 System

8- Mechanical pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.01- System Mechanical Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.02- Equipment Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.03- Equipment Datasheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.04- Boxing-up Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.05- Grouting Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.06- Pre-Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

8.07- Mechanical Pre-Commissioning Checklists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9- Mechanical Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9.01- Final Alignment Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9.02- Motor Solo Run Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9.03- Mechanical Run Test (MRT) Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9.04- Mechanical Commissioning Checklists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

9.05- Mechanical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10- Instrumentation Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.01- System Instrument Index



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.02- Instrument Data Sheets



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.03- Instrument Cable Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.04- System Instrumentation Wiring Diagram



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.05- Hook-up Drawing (Mechanical & Pneumatic)

System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.06- Instruments Cables Schedule



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.07- Instruments Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.08- Instruments Cables Termination Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.09- Instruments Cables Testing Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.10- Instruments Calibration Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.11- Instrument Loop Checks Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.12- Instrumentation Pre-Commissioning Check Lists

System ID	030-EL-020
System Description	Electrical Power Module-4 System

10.13- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

11- Instrumentation Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

11.01) Instrumentation Function Test Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

11.02- Instrumentation Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12- Electrical Pre-Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.01- System Electrical Index

030-EL-020
030-EL-020
030-EL-020

Electrical Power Module-4 System
Electrical Power Module-4 System
Electrical Power Module-4 System

Electrical
Electrical
Electrical

P-030-EPMA-IR-1
C-030-EPMA-LVSWG
P-030-EPMA-DP-2
P-030-EPMA-UPDP-1

HV Cable
LV Cable
LV Cable
LV Cable

Checklist
Checklist
Checklist
Checklist

EL-31 A
EL-31 A
EL-31 A
EL-31 A



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.02- Electrical Drawings

System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.03- Motor Datasheets

System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.04- Electrical Cables Schedule

AGE+AI:13	Cable Mark	GL1	FROM	TO	GL2	CABLE Service	Service Voltage	KW	Size	Type	L
57	P-030-EPM4-TR-1	WP	030-SUB-HVSWG-6.6 (Q3B)	030-EPM4-TR-1	WP	HV POWER FEEDER	6600VAC	500	3x70	3A	940
57	C-030-EPM4-LVSWG	WP	030-EPM4-LVSWG (A1.1)	030-SUB-HVSWG-6.6 (Q3B)	WP	INTERTIP			10x2.5	C1	940
57	P-030-EPM4-LPPD-1	WP	030-SUB-ACUPS-1	030-EPM4-LPPD-1	WP	3PH POWER FEEDER	400VAC	5.0	3.5x50	4B	940
58	P-030-EPM4-DP-2	WP	030-EPM4-LVSWG-1 (A2.2)	030-EPM4-DP-2	WP	3PH POWER FEEDER	400VAC	40	4x25		



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.05- Electrical Cables Laying Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.06- Electrical Cables Testing Certificates

INSPECTION AND TEST REPORT FOR
HI POT INSULATION TEST

SYSTEM NO.:

INSPECTION REPORT NUMBER

INSPECTION DATE & TIME

ITR NUMBER

DISPLINE

SHEET NO

RFI-159

ITR-EL-0008

1 OF 1

Item/Tag NO.

Type :-

Core:

Size:

NO.	Description of check	RESULT		
		ACCEPT	REJECT	N/A.
1	No damage of cable has found and maintain insulation resistance	✓		
2	Correct cable type/size/ installed as per approved drawing	✓		
3	Calibration test certificate of testing equipment to be checked.	✓		

Continuity Test :

☒ ACCEPT

☐ REJECT

☐ N/A.

Test Equipment List

INSTRUMENT TYPE:	SERIAL:	SERVICE VOLTAGE:	TEST VOLTAGE:

Insulation Resistance Test MΩ

PHASE TO PHASE			PHASES TO ARMOR		
BR-BK	BR-GR	BR-GR	BR-ARM	BK-ARM	GR-ARM

Hi-Pot test

Phase BR Test Voltage (..... kV)

Phase	TEST VOLTAGE	TIME	CURRENT
ARM,BK,GR_BR		15 Min	< 100 MA

Phase BK Test Voltage (..... kV)

Phase	TEST VOLTAGE	TIME	CURRENT
ARM,BR,GR_BK		15 Min	< 100 MA

Phase GR Test Voltage (..... kV)

Phase	TEST VOLTAGE	TIME	CURRENT
ARM,BR,BK_GR		15 Min	< 100 MA

Insulation Resistance Test MΩ

PHASE TO PHASE			PHASES TO ARMOR		
BR-BK	BR-GR	BR-GR	BR-ARM	BK-ARM	GR-ARM
150 GΩ	178 GΩ	236 GΩ	45.5 GΩ	52 GΩ	61 GΩ

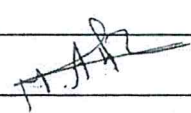
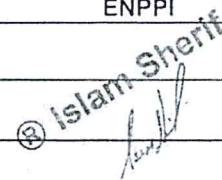
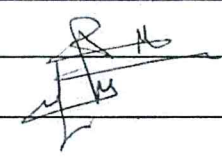
Remarks :

INSPECTION RESULTS:

☒ APPROVEI

☐ REJECT

☐ APPROVED W/ COMMENT

	PETROJET	ENPPI	PMC
NAME			
SIGNATURE			
DATE			



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR
CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER
REF:17

SERIAL:

INSPECTION DATE & TIME

SERVICE VOLTAGE:
220 v

DOCUMENT NO.
ITR-EL-0006A

DISCIPLINE
ELECTRICAL

AREA / PACKAGE:

SYSTEM NO.:

SHEET NO

TEST VOLTAGE:
1kv

N O	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE "M.Ohm"			PHASE TO NEUTRAL "M.Ohm"			PHASES & NEUTRAL TO ARMOR "M.Ohm"			RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass
1	P-030-SUB-PFC-1A	3 x 7 ₆	✓	0.1	0.1	0.1							✓	
2	P-030-SUB-PFC-1B	3 x 7 ₆	✓	0.1	0.1	0.1							✓	
3	P-030-EPMA1-TR-1	3 x 7 ₆	✓	0.1	0.1	0.1							✓	
4	P-030-EPMA3-TR-1	3 x 7 ₆	✓	0.1	0.1	0.1							✓	
5	P-030-EPMA4-TR-1	3 x 7 ₆	✓	0.1	0.1	0.1							✓	
6			—		0									
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														

Remarks :-

Reference :-

PETROUJET		ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-EL-0006A



Enppi

EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER

PTJ-ELE-RFI-167

INSTRUMENT TYPE:

HIGH VOLTAGE INSULATION TESTER-SANWA-MG5000

INSPECTION DATE & TIME

05/04/2021

DOCUMENT No.

ITR-EL-0006A

DISCIPLINE

ELECTRICAL

SYSTEM NO.:

SHEET NO

SERIAL:

17015900385

SERVICE VOLTAGE: 400

TEST VOLTAGE: 1000

AREA / PACKAGE:
SUBSTATION

SUBSTATION														
NO	Item/Tag NO.	CABLE SIZE	Continuity Test	PHASE TO PHASE			PHASE TO NUETRAL "M.Ohm"			PHASES & NUETRAL TO ARMOR "M.Ohm"			RESULT	
				BR-BK	BR-GR	BK-GR	BR-B	BK-B	GR-B	BR-ARM	BK-ARM	GR-ARM	B-ARM	Pass
1	P-030-EPM4-UPDP-1	3.5x50	✓	o.l	o.l	o.l								—
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														

Remarks :-

Reference :-

PETROJET		ENPPI		PMC	
NAME :		NAME :		NAME :	
SIGNATURE		SIGNATURE		SIGNATURE	
DATE		DATE		DATE	

ITR-EL-0006A



EGPC CRUDE OIL TANK FARM

INSPECTION AND TEST REPORT FOR

CABLE INSULATION RESISTANCE TEST

INSPECTION REPORT NUMBER

PTJ-ELE-RFI-167

INSTRUMENT TYPE:

HIGH VOLTAGE INSULATION TESTER-SANWA-MG5000

SERIAL:

17015900385

SERVICE VOLTAGE:

24

TEST VOLTAGE:

500

DOCUMENT No.

ITR-EL-0006B

DISCIPLINE

ELEC

SYSTEM NO.:

SHEET NO

AREA / PACKAGE:

NO	Item/Tag NO.	CABLE SIZE	Continuity Test	pair conductors	conductors to armor	Shield to Shield	All Conductors - GND	Overall Shield -GND	Armor -GND	RESULT
1	C-030-EPM4-LVSWG	10x2.5	✓	o.l						Pass
2	C2-030-MXM-04A	12x2.5	✓	o.l						Pass
3	C2-030-MXM-04B	12x2.5	✓	o.l						Pass
4	C2-030-MXM-04C	12x2.5	✓	o.l						Pass
5	C2-030-MXM-04D	12x2.5	✓	o.l						Pass
6	C2-030-MXM-04E	12x2.5	✓	o.l						Pass
7	C2-030-MXM-04F	12x2.5	✓	o.l						Pass
8										
9										
10										
11										
12										



Remarks :-

Reference

NAME :	PETROJET	ENPPI	PMC
SIGNATURE			
DATE:			

ITR-EL-0006B

12.07- Electrical Cables Termination Certificates

System ID		030-EI-020
System Description		Electrical Power Module-4 System
<div>  Enppi PETROJET </div> <div> Project: 01251-100 CRUDE OIL TANK FARM PROJECT (AGROOD AREA) </div> <div>  </div>		

**Enppi****EGPC CRUDE OIL TANK FARM**Owner : **Egyptian General Petroleum Corporation (EGPC)**Project No: 01251-100-030
:01251-100-031Contractor **CONSORTIUM (ENPPI / PETROJET)**Document No: ITR-QC-0001
Revision No. : 00**REQUEST FOR INSPECTION**ACTIVITY : **CABLE TERMINATION AND TEST**NOTIFICATION NO. : **PTJ-ELE-RFI- 167** DISCIPLINE : **ELEC**DATE : **05/04/2021**

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
1	C-030-EPM4-LVSWG	SUBSTATION					
2	C2-030-MXM-04A	SUBSTATION					
3	C2-030-MXM-04B	SUBSTATION					
4	C2-030-MXM-04C	SUBSTATION					
5	C2-030-MXM-04D	SUBSTATION					
6	C2-030-MXM-04E	SUBSTATION					
7	C2-030-MXM-04F	SUBSTATION					
8	P-030-EPM4-UPDP-1	SUBSTATION					
9							
10							
11							
12							
13							
14							
15							
16							
17							

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-QC-0001



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:

INSPECTION REPORT NUMBER

INSPECTION DATE & TIME

ITR NUMBER

DISCIPLINE

SHEET NO

PTJ-ELE-RFI- 167

05/04/2021

ITR-EL-0009

ELEC

1 OF 1

Item/Tag NO.

For All Cables tags in PTJ-ELE-RFI-

Type :-

Core:

Size:

NO.	Description of check	RESULT		
		ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *I	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *II			✓
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications	✓		
9	Check enclosure cover is installed, no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.	✓		

Remarks :

*I : ITR-EL-006A/B

*II : ITR-EL-008

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-EL-0009

**Enppi**

EGPC CRUDE OIL TANK FARM



Owner : Egyptian General Petroleum Corporation (EGPC)

Project No: 01251-100-030
:01251-100-031

Contractor CONSORTIUM (ENPPI / PETROJET)

Document No: ITR-QC-0001
Revision No. : 00**REQUEST FOR INSPECTION**

ACTIVITY : cable termination and splicing

NOTIFICATION NO. : PTJ-ELEC-RFI-174 DISCIPLINE : E&I

DATE : 4/22/2021

NO.	DESCRIPTION	LOCATION	DATE / TIME	INSPECTION			REMARKS
				PETROJET	ENPPI	PMC	
	Mcs Installation	MODULE 1	28-Mar-21				
1	P-030-SUB-PFC-1A						
2	P-030-SUB-PFC-1B						
3	P-030-EPM1-TR-1						
4	P-030-EPM3-TR-1						
5	P-030-EPM4-TR-1						
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							

NOTE:

Inspection result : A - Approved B - Reject C - Approved with Comment

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-QC-0001



EGPC CRUDE OIL TANK FARM



INSPECTION AND TEST REPORT FOR

CABLE TERMINATION AND SPLICING

SYSTEM NO.:

INSPECTION REPORT NUMBER

INSPECTION DATE & TIME

ITR NUMBER

DISCIPLINE

SHEET NO

PTJ-ELE-RFI-17

ITR-EL-0009

ELEC

1 OF 1

Item/Tag NO.

Type :-

Core:

Size:

NO.	Description of check	RESULT		
		ACCEPT	REJECT	N/A.
1	Check cable glands are correct type and size as per cable schedule.	✓		
2	Check there are no damages to cores, termination chamber layout is satisfactory, core identification is correct, crimped and pins satisfactory.	✓		
3	Check cable tag is done correctly.	✓		
4	Test and confirm conductor, phase continuity.	✓		
5	Check insulation resistance test (megger) is completed *I	✓		
6	Check Hi-pot test is completed, only for MV/HV cables *II	✓		
7	Connect all cores at both ends and confirm all connections are correct as per termination diagram.	✓		
8	Confirm spare cores, screens are earthed and conform to design drawings/specifications			✓
9	Check enclosure cover is installed, no damages and no bolts are missing	✓		
10	Calibration test certificate of testing equipment to be checked.	✓		

Remarks :

	PETROJET	ENPPI	PMC
NAME :			
SIGNATURE			
DATE			

ITR-EL-0009

System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.08- FAT Reports & Certificates



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.09- SAT Reports & Certificates

3061-026

**CRUDE OIL TANK FARM
1251-100**

EPM MODULE 030-EPM4

SAT

**Commissioning and Site Integration Test
Procedures**

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0001 R.1				
					Language: E		Total Pages: 19
This document is the property of Enppi It must not be stored, reproduced or disclosed to others without written authorization from the COMPANY							



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

DP-1 Indoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-16-7				
			Enppi Ref.: 01251-100-S07-P06-0007 R.1				
					Language: E		Total Pages. 11
This document is the property of Enppi. It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

INTRODUCTION SAT PROCEDURE.....	3
Aim of the Document.....	3
1.1 Personnel involved in the SAT	3
1.2 DOCUMENTATION	4
2. TESTING STRATEGY.....	4
3. INSTALLATION TESTING.....	5
3.1 Documentation check.....	5
3.2 INSTALLATION CHECK.....	6
3.3 POWER SUPPLY CHECK.....	8
4. FUNCTIONAL TESTING.....	9
4.1 Electrical equipment.....	9
5 COMMISSIONING AND START-UP PROCEDURES DP 1.....	10
5.1 Preliminary operation.....	10
5.1.1. Mechanical assembling.....	10
5.1.2 Electrical / Instrument connecting.....	10
5.1.3 Check and Test with Voltage supply.....	10
5.1.4 Test the circuit one by one and not at the same time.....	11

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Indoor DP-1 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-1 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and SAT Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Khadeem	ENPPI		5/8/2021
M. Ibrahim	PPC		5/7/2021
CORA COTTIN P.A. 9612	CEAR		05-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0002	R.4	Indoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0002	R.4	Indoor Panel Single & Wiring diagram.
01251-100-S07-K11-0007	R.4	EPM Filled in DP-1 Indoor Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:




- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

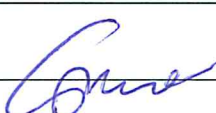
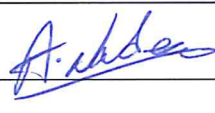

- Electrical equipment;


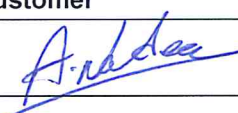
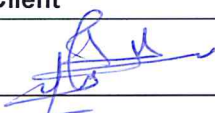
3. INSTALLATION TESTING

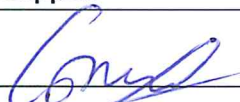

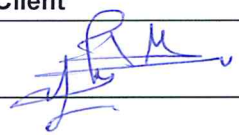
3.1 Documentation check.

3.1	Documentation check.			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

3.2 INSTALLATION CHECK

DP-1 Indoor Distribution Panel				
3.2.1	Aim	Check the DP-1 identification label.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The DP-1 identification label must be in compliance with the following documents: 01251-100-S07-E10-0002 Indoor Panel Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
	05-07-21			

DP-1 Indoor Distribution Panel Front lay-out				
3.2.2	Aim	Check the front DP-1 layout.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The front layout must be in compliance with the following documents: 01251-100-S07-E10-0002 Indoor Panel Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout.		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
	05-07-21			

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	<p>All the mechanical and electrical interlocks described on the following documents must be operative:</p> <p>The DP-1 arrangement must be in compliance with the following documents:</p> <p>01251-100-S07-E10-0004 UPS Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout</p>		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

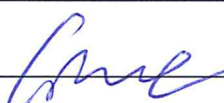


3.3 POWER SUPPLY CHECK

Main circuits Power supply					
3.3.1	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: <u>HT 17340</u> Mod.: <u>HT 8200</u> S/N: <u>9860599</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>400V</u>	Frequency	<u>50Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
	<u>05-07-21</u>	<u>Cone</u>	<u>A. Abdelaziz</u>	<u>[Signature]</u>	

Auxiliary circuits Power supply					
3.3.2	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>HT 17340</u> Mod.: <u>HT 8200</u> S/N: <u>9860599</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>230V</u>	Frequency	<u>50Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
	<u>05-07-21</u>	<u>Cone</u>	<u>A. Abdelaziz</u>	<u>[Signature]</u>	

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1	DP-1 operating conditions.				
	Aim	Check the functioning of the DP-1			
	Pre-requisites	N.A.			
	Test description	Check the circuit breaker, signal lamps and verify the output distribution			
	Acceptance criteria	The electrical functioning of the DP-1 must be in compliance with the following document: 01251-100-S07-E10-0002 Indoor Panel Single & Wiring Diagram			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					

5 COMMISSIONING AND START-UP PROCEDURES DP 1 INDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Indoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:

The indoor provide supply the internal EPM circuit and 230V 50 Hz internal and external socket.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the distribution Panel is ready for electrical test without voltage supply

Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

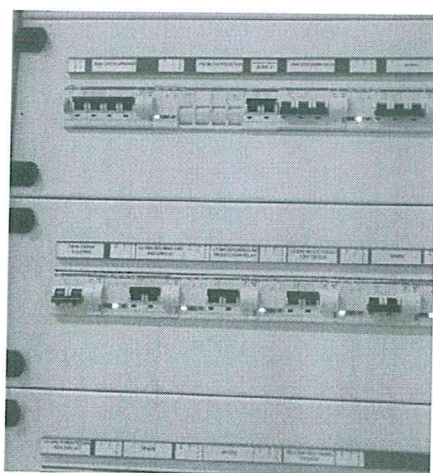
The indoor panel DP 1 is provided with the following measuring control (see picture):



- Main circuit breaker
- Ammeter and relevant ammeter switch
- Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0002-Indoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF1.1 and supply the aux. transformer for signal lamp.
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the main breaker QF1 to supply all circuit breaker Closed the breaker QF0 for pilot circuit emergency light
Close the Circuit Breaker QF2 to QF12 step by step to supply circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

DP-2 Outdoor Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0008 R.1				
					Language: E		Total Pages:13
This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

INTRODUCTION SAT PROCEDURE.....	3
Aim of the document.....	3
1.1 Personnel involved in the SAT.....	3
1.2 DOCUMENTATION.....	4
2. TESTING STRATEGY.....	4
3. INSTALLATION TESTING.....	5
3.1 Documentation check.....	5
3.2 General construction Check.....	6
3.3 Power supply Check.....	9
4. FUNCTIONAL TESTING.....	10
4.1 Electrical equipment.....	10
5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL.....	11
5.1 Preliminary operation.....	11
5.1.1. Mechanical assembling.....	11
5.1.2 Electrical / Instrument connecting.....	11
5.1.3 Check and Test with Voltage supply.....	11
5.1.4 Test the circuit one by one and not at the same time in order to check correctly	12 12

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Outdoor DP-2 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-2 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Almed Nadeem	ENPPI		5/7/2021
M. Elbarh	PPC		5/7/2021
COM. COM. FABIO	CEAR		05-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001		General Arrangement
01251-100-S07-E02-0003		Outdoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0003		Outdoor Panel Single & Wiring diagram.
01251-100-S07-K11-0008		EPM Filled in DP-2 Outdoor Distribution Panel Data Sheet
01251-100-S07-E05-0002		EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

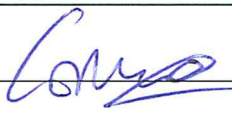
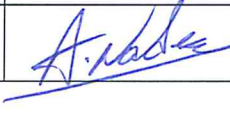
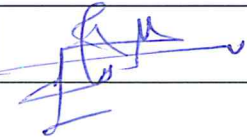
- Documentation;
- Mechanical installation;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

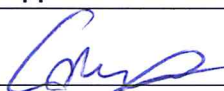
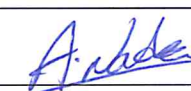
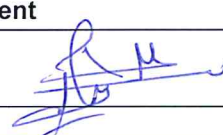
- Electrical equipment

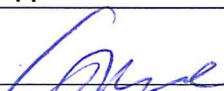

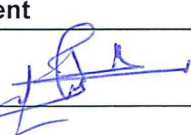
3. INSTALLATION TESTING.

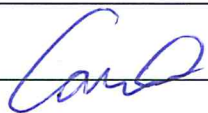
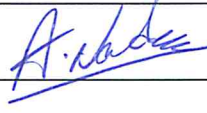

3.1 Documentation check.

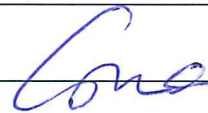
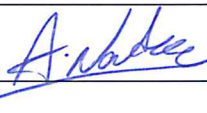
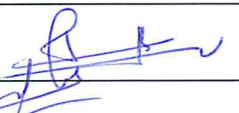
3.1	Documentation check.			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				



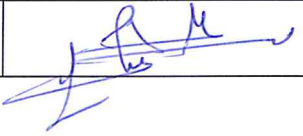
3.2 General construction Check

Terminal block connections.			
Aim	Check the terminal block connections (wiring and tightening).		
Pre-requisites	N.A.		
Test description	Visual inspection and tightening test (with a screw driver).		
Acceptance criteria	The terminal block connections must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout		
Instrument	Screw driver.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

Earthing connections.			
Aim	Check the earthing connections (wiring and tightening).		
Pre-requisites	N.A.		
Test description	Visual inspection and tightening test (with a screw driver or a wrench).		
Acceptance criteria	The earthing connections must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E99-0009 Earthing System Internal External Layout		
Instrument	Screw driver, Wrench.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

Electrical equipment labels.				
3.2.3	Aim	Check the equipment labels.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The electrical equipment labels must be in compliance with the following document: 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

DP-2 Cleanliness of the equipment				
3.2.4	Aim	Check the cleanliness of the equipment.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria			
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

3.2.5	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-2 arrangement must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

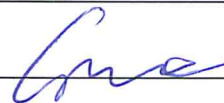
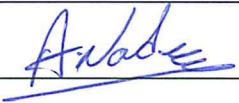
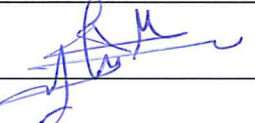
3.3 Power supply Check

Main circuits Power supply					
3.3.1	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: <u>HT 17047</u> Mod.: <u>HTJ200</u> S/N: <u>98600509</u> Test Certificate: <u>2564</u>			
	Measured voltage	Value	<u>400V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
	<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	

Auxiliary circuits Power supply					
3.3.2	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>HT 17047</u> Mod.: <u>HTJ200</u> S/N: <u>98600509</u> Test Certificate: <u>2564</u>			
	Measured voltage	Value	<u>230V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
	<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	DP-2 operating conditions.			
	Aim	Check the functioning of the DP-2		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution. Check the operation of photocell and relevant contactor.		
	Acceptance criteria	The electrical functioning of the DP-2 must be in compliance with the following document: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Outdoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:

The outdoor panel provide supply the perimetral and roof top EPM lighting circuits and all area external lighting system installed by Enppi.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the distribution Panel is ready for electrical test without voltage supply

Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

The indoor panel DP 2 is provided with the following measuring control (see picture):



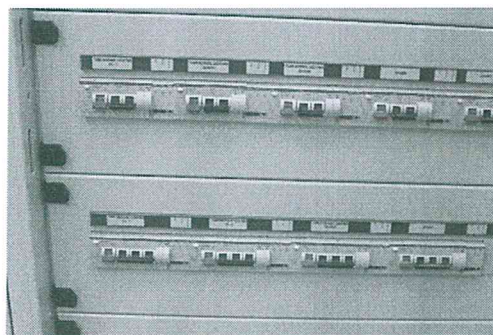
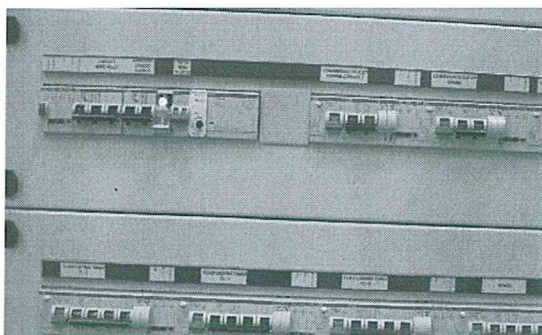
-Main circuit breaker

-Ammeter and relevant ammeter switch

-Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



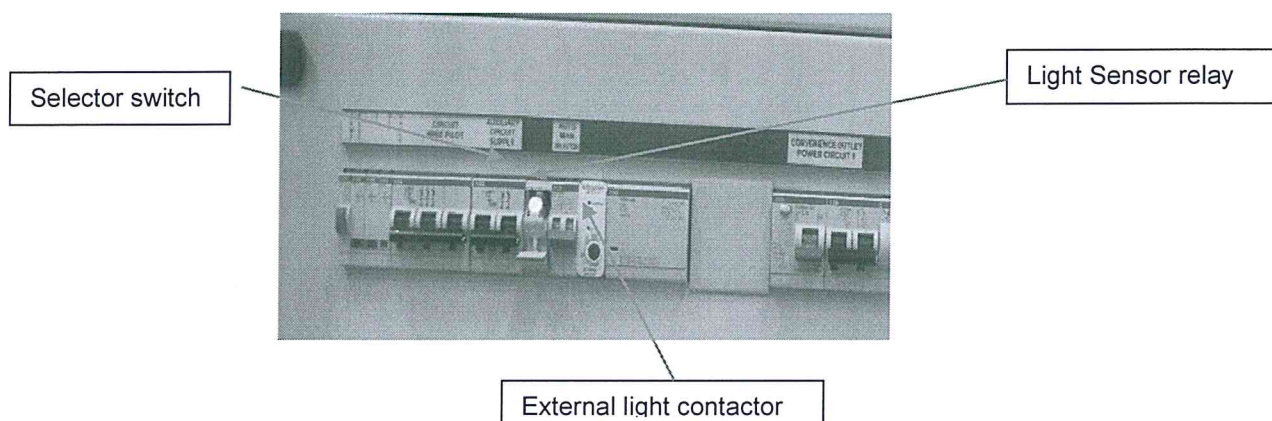
The outdoor panel is provided with the section for outdoor lighting system controlled by light sensor installed under the roof top.

This section is equipped with:

- Selector switch 3 position "Man.-0-Auto"
- Light sensor relay

In "Auto" position the lighting system is controlled by an external sensor that provide to command the contactor for external lighting system based on the daylight.

In "Manual" position the lighting system is always on, the sensor is not operated



The next description includes the action for each section step by step.

For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1

Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.

Close the Main Circuit breaker QF1

By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker

Closed the breaker QF 0 for pilot circuit emergency light

Close the Circuit Breaker QF 3 QF 4 QF 5 step by step to supply all circuit convenience outlet sockets and check the output voltage by voltmeter.

For Each circuit breaker are provided the following signal lamp:

- Red Lamp Circuit breaker close
- Green Lamp Circuit breaker open
- Yellow Lamp Fault

Close the Circuit Breaker QF6 to QF13 step by step to supply all circuit and check the output voltage by voltmeter.

For Each circuit breaker are provided the following signal lamp:

- Red Lamp Circuit breaker close
- Green Lamp Circuit breaker open
- Yellow Lamp Fault

CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

BUS DUCT

SAT Commissioning and Site Integration Test Procedures

1	17/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-510-16				
			Enppi Ref.: 01251-100-S07-P06-0004 R.1				
			Language: E		Total Pages:9		
This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANYY							

INDEX

Aim of the document	3
Personnel involved in the SAT	3
DESCRIPTION OF THE TESTS.....	4
1 Documentation.....	4
2. Visual Check	6
3. Electrical Safety Check	7

INTRODUCTION BUS DUCT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Nadeem	ENPPI		5/7/2021
M. Ibrahim	PPC		5/7/2021
COTI, COTINI FABIO	CEAR		05-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

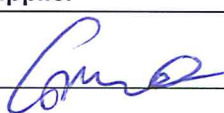
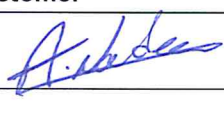
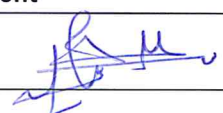
Identification and Marking Check will

Safety check insulation and dielectric test

1 Documentation.

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

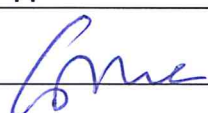
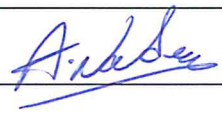
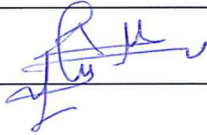
Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0006	R.2	EPM Bus Duct Data Sheet Supplier
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement



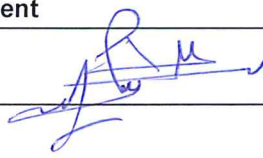
Documentation check				
1.1.1	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

6 of 9

3. Electrical Safety Check

Electrical Safety Check Insulation resistance measuring	
Aim	Measure the insulation resistance between each phase and neutral against earth (with the remaining phases and neutral connected to the earth).
Pre-requisites	N.A.
Test description	The insulation resistance tests shall be carried out with all manually operated and latched type switching devices in the closed position and main fuses installed.
Acceptance criteria	The insulation resistance measured shall be at least 10 MΩ.
Instrument	Type: CHAUOVIM... ARMO... Ux... Mod.: 606505... S/N : 167858.P6H Test Certificate : SM/167858.P611
3.1.1 Test results	Value checked L1-E: 3,38 GΩ L2-E: 3,26 GΩ L3-E: 3,30 GΩ N-E: 6,10 GΩ
Notes	
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier
Customer	Client
05-07-21	

Electrical Safety Check Dielectric test for bus bars				
3.1.2	Aim	Perform a dielectric test of the main circuits (400V ac) in accordance with CEI EN 61439-1 standard.		
	Pre-requisites	N.A.		
	Test description	Withstand voltage should be 2500 V ac for 1 minute. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: <u>Mo.TNA</u> Mod.: <u>MF2170</u> S/N: <u>5400.5</u> Test Certificate : <u>3004-01</u>		
	Test results	<u>L1-0 = 3.15 MA</u> <u>L2-0 = 1.15 MA</u> <u>L3-0 = 1.15 MA</u> <u>N-0 = 4.12 MA</u>		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

Earthing Bus Duct continuity check			
Aim	Verify t the installation of the earthing system of the Bus Duct		
Pre-requisites	N.A.		
Test description	The installation and the material must be in compliance with the values reported on the following documents: 01251-100-S07-E99-0009 Earthing System Layout 01251-100-S07-K009-0006 EPM Bus Duct Data Sheet Supplier 01251-100-S07-K011-0006 EPM Filled in Purchaser Bus Duct Data Sheet		
Acceptance Criteria	The resistance measured shall be at least $< \Omega$.		
Instrument	Type: <u>CHAUVIN ARNOUX</u> Mod.: <u>CA 6505</u> S/N <u>SNV 147850 POK</u> Test Certificate : <u>F.85017</u>		
3.1.3	Value checked: <u>L1</u> Ω		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
<u>05-07-21</u>			



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

DRY TYPE TRANSFORMER

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0003 R.1				
					Language: E		Total Pages:9
This document is the property of Enppi. It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
Personnel involved in the SAT.....	3
DESCRIPTION OF THE TESTS.....	4
1. Documentation.....	4
2. Visual Check (without voltage supply).....	6
3. H.V. Cable Connection box.....	7
4. Earthing Connection Check (without voltage supply).....	8
5. H.V. Transformer energization 6,6 kV from Enppi substation (Power ON).....	9

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Kadeem	ENPPI		5/7/2021
M. Dardar	PPC		5/7/2021
CORR. CORUM FABIO	CEAR		05-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check

Routine test certificate check

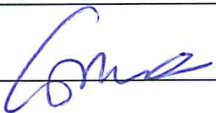
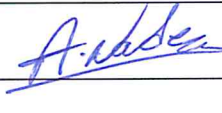
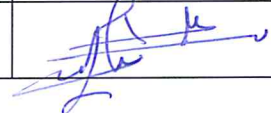
1. Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).


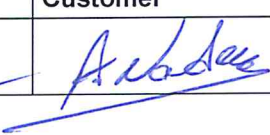
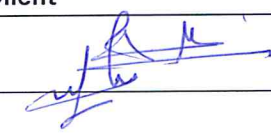
Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement
01251-100-S07-K09-0005	R.3	EPM Transformer Data Sheet Supplier
01251-100-S07-K11-0005	R.4	EPM Filled in Purchaser Transformer Data Sheet
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K12-0001	R.1	EPM Noise Data Sheet
01251-100-S07-E99-0009	R.4	Earthing system layout
01251-100-S07-E10-0001	R.5	LVSWG Single Line Diagram

1.1

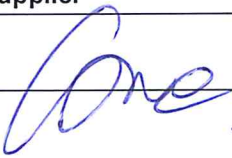
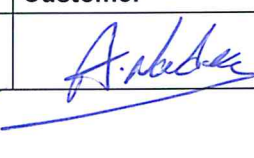
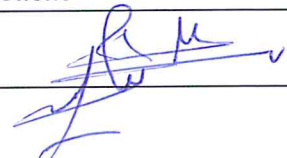
2. Visual Check (without voltage supply)

Visual Check			
Aim	Visual check of the good construction of the transformer and the transformer box		
Pre-requisites	N.A.		
Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.		
Acceptance criteria	Visual test and relevant photo		
2.2.1	<div>Notes</div>		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

3. H.V. Cable Connection box


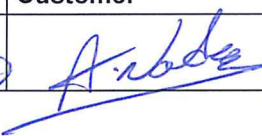
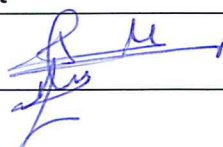
HV Cable Connection box			
Aim	Verify the connection between transformer and HV box		
Pre-requisites	N.A.		
Test description	Visual connection marking check and tightening bolt control		
Acceptance criteria	The dimensions must be in compliance with the values reported on the following documents: 01251-100-S07-E99-000 7 Dry Type transformer General Arrangements		
Marking phase check			
Notes	<p>IMPORTANT NOTE</p> <p>All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department.</p> <p>Before supply the transformer with 6,6 kV all test must be done and certified with a test report.</p>		
Executed	<input type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

4. Earthing Connection Check (without voltage supply)

Earthing Connection continuity check			
Aim	Verify the installation of the earthing connection		
Pre-requisites	N.A.		
Test description	The installation and the material must be in compliance with the values reported on the following documents: 01251-100-S07-E99-0009 Earthing System Layout 01251-100-S07-K009-0005 EPM Transformer Data Sheet Supplier		
Acceptance Criteria	The resistance measured shall be at least $< \Omega$.		
Instrument	Type: CHAUVIN ARNOUX..... Mod.: CA6505 S/N: SDV 147858PG21 Test Certificate: F85012.....		
Notes	Resistance value: $< 1 \dots \Omega$		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

5. H.V. Transformer energization 6,6 kV from Enppi substation (power on)

The activity is in charge of Enppi commissioning department

Power on transformer 6,6 kV			
Aim	Energize the EPM transformer from the substation Enppi		
Pre-requisites	All operations and safety rules must be in charge of Enppi		
Test description	Energizing operation from the substation		
Acceptance Criteria	Verify the voltage value in accordance with the 01251-100-S07-K009-0005 EPM Transformer t Data Sheet Supplier		
Instrument	Verify and check the voltage value in the substation room		
Notes	<p>IMPORTANT NOTE All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department. Before supply the transformer with 6,6 kV all test must be done and certified with a test report. Report test check Power supplykV L1-L2:kV L2-L3:kV L3-L1:kV</p> <p>Insulation resistance test H.V cable Resistance value: Ω</p> <p>Dielectric test H.V. cable</p> <p><i>* Tr. power-up shall be performed upon availability of 6.6 kV supply</i> <i>Not Available</i></p>		
Executed	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

UPDP Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-510-16				
			Enppi Ref.: 01251-100-S07-P06-0009 R.1				
					Language: E		Total Pages: 12
This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
1.1 Personnel involved in the SAT.....	3
1.2 DOCUMENTATION.....	4
2. TESTING STRATEGY.....	4
3.1 Documentation check.....	5
3.2 INSTALLATION CHECK.....	6
3.3 POWER SUPPLY CHECK.....	8
4. FUNCTIONAL TESTING.....	9
4.1 Electrical equipment.....	9
5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL	10
5.1 Preliminary operation.....	10
5.1.1. Mechanical assembling.....	10
5.1.2 Electrical / Instrument connecting.....	10
Field test check.....	10
Check and Test without voltage supply.....	10
5.1.3 Check and Test with Voltage supply.....	11
5.1.4 Test the circuit one by one and not at the same time in order to check correctly.....	11

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the UPS Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied UPS Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
<i>Ahmed Nadeem</i>	ENPPI	<i>A. Nadeem</i>	5/7/2021
<i>M. Ibrahim</i>	PPC	<i>M. Ibrahim</i>	5/7/2021
<i>Cottin Cottin FABIO</i>	CEAR	<i>Cottin</i>	05-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0004	R.4	UPS Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0004	R.4	UPS Panel Single & Wiring diagram.
01251-100-S07-K11-0009	R.2	EPM Filled UPS Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:


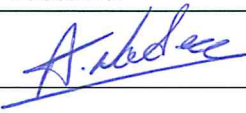
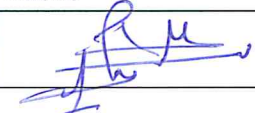
- Documentation;
- Mechanical installation ;
- Electrical installation.

The **Functioning** testing phase is developed to test the functioning of the:

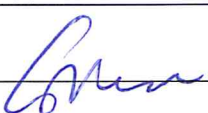
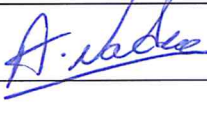
- Electrical equipment




3. INSTALLATION TESTING.

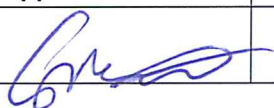

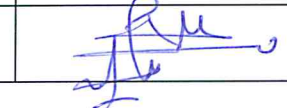
3.1 Documentation check.

3.1	Documentation check.				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					

3.2 INSTALLATION CHECK

3.2.1	Earthing connections.				
	Aim	Check the earthing connections (wiring and tightening).			
	Pre-requisites	N.A.			
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).			
	Acceptance criteria	The earthing connections must be in compliance with the following documents: 01251-100-S07-E10-0004 UPS Single & Wiring Diagram 01251-100-S07-E99-0009 Earthing System Internal External Layout			
	Instrument	Screw driver, Wrench.			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					

3.2.2	UPS Cleanliness of the equipment				
	Aim	Check the cleanliness of the equipment.			
	Pre-requisites	N.A.			
	Test description	Visual inspection.			
	Acceptance criteria				
	Instrument	N.A.			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	<p>All the mechanical and electrical interlocks described on the following documents must be operative:</p> <p>The UPS arrangement must be in compliance with the following documents:</p> <p>01251-100-S07-E10-0004 UPS Single & Wiring Diagram 01251-100-S07-E02-0004 UPS Overall Dimension Panel Layout</p>		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

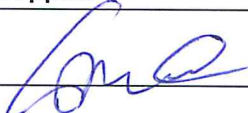
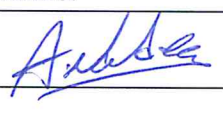
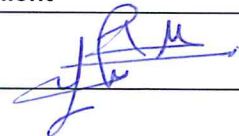
3.3 POWER SUPPLY CHECK

Main circuits Power supply				
3.3.1	Aim	Check the main circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the main power supply voltage.		
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
	Instrument	Type: <u>HT 1T041A</u> Mod.: <u>HT8100</u> S/N: <u>88600508</u> Test Certificate: <u>7544</u>		
	Measured voltage	Value	<u>400 V</u>	Frequency <u>50 Hz</u>
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
	<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>

Auxiliary circuits Power supply				
3.3.2	Aim	Check the auxiliary circuits power supply.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the value of the auxiliary power supply voltage.		
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
	Instrument	Type: <u>HT 1T041A</u> Mod.: <u>HT8100</u> S/N: <u>88600508</u> Test Certificate: <u>7544</u>		
	Measured voltage	Value	<u>230V</u>	Frequency <u>50 Hz</u>
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
	<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	UPS operating conditions.				
	Aim	Check the functioning of the UPS			
	Pre-requisites	N.A.			
	Test description	Check the circuit breaker, signal lamps and verify the output distribution			
	Acceptance criteria	The electrical functioning of the UPS must be in compliance with the following document: 01251-100-S07-E10-0004 UPS Single & Wiring Diagram			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-02-21					

5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL

5.1 Preliminary operation

The UPS panel provide to fed the auxiliary and command circuit of the LVSWG MCC panel the power supply of the F&G panel, the supply for external shut down valve and the Tank Radar Gauging.

The UPS is powered from the Enppi UPS Substation so as to guarantee continuity of power supply even in the event of a power loss.

Before starting-up the electrical and instrumentation commissioning of UPS Panel all connection with the other panel will be terminated and all the followings point should be checked and confirmed:

The circuit breakers of the others panel connected to the UPS panel must be in open position.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the UPS Panel is ready for electrical test without voltage supply

Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the UPS Panel is ready for electrical and instrument test with power supply.

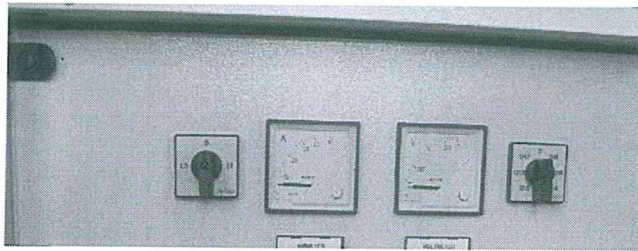
5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

Require to Enppi supervisor to close the power circuit breaker in the UPS Substation and verify the voltage value.

The verification and the connection of the power supply cable is in charge to Enppi

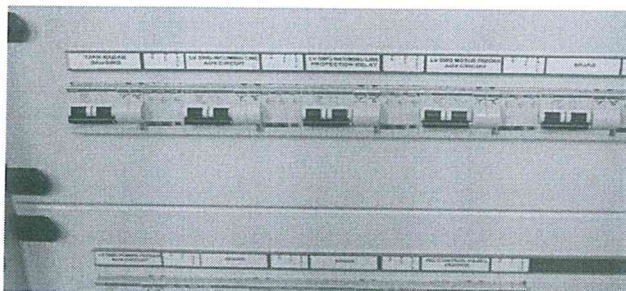
The UPS panel is provided with the following measuring control (see picture):



- Main circuit breaker
- Ammeter and relevant ammeter switch
- Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the Circuit Breaker QF 2 to QF 12 step by step to supply all circuit and check the output voltage by voltmeter. For each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

LVSWG MCC

SAT



Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	20/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-16-7				
			Enppi Ref.: 01251-100-S07-P06-0002 R.1				
					Language: E		Total Pages:30
This document is the property of Enppi It must not be stored, reproduced or disclosed to others without written authorization from the COMPANY							



INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
TESTING STRATEGY.....	3
Safety precaution.....	3
Personnel involved in the SAT.....	4
DESCRIPTION OF THE TESTS.....	4
1.1. Testing Equipment to be used.....	5
1.2. Documentation.....	6
1.2.1. Documentation check	7
2. GENERAL CONSTRUCTION CHECK	8
3. EQUIPMENT CHECK	11
4. ELECTRICAL SAFETY CHECK.....	12
5. POWER SUPPLY CHECK.....	15
6. FUNCTIONAL TESTING.....	18
6.1. Electrical equipment.....	18
7. COMMISSIONING and START-UP PROCEDURES	23
7.1. Preliminary operations.....	23
7.1.1 Mechanical assembling check list.	23
7.1.2 Electrical connection check list.	23
7.1.3 Checks without power supply.....	23
7.2. COMMISSIONING	24
7.3. INCOMING LINE SWITCH FUNCTION (column 1).....	25
7.3.1. NORMAL OPERATION.....	25
7.3.2. POWER SUPPLY LOSS	26
7.3.3. POWER RESTORATION	26
7.4. LVSWG MCC Columns	27
7.4.1. Drawer feeder commissioning/operating (column 2).....	27
7.4.2. DOL drawer commissioning/operating (column 3 and 4)	28

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	 <small>COSTRUZIONI ELETTROTECNICHE CEAR s.r.l.</small>
---	--	---

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's
- Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.

We will describe the company safety rules and the rules to be followed while attending the test.

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
<i>Ahmed Kader</i>	ENPPI	<i>A. Kader</i>	5/7/2021
<i>M. Ibrahim</i>	PPC	<i>M. Ibrahim</i>	5/7/2021
<i>Com. Control FABIO</i>	CEAR	<i>FABIO</i>	05-07-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship and correct installations

This document is the Site Acceptance Test for the Motor Control Center.

The document is the acceptance protocol concerning the hardware characteristics of the supplied MCC.

1.1. Testing Equipment to be used

Following a list of the instruments shall be available during the SAT by ENPPI:

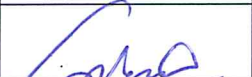
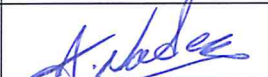

Instrument	Model	Serial Number	Calibration expiry date
Electrical safety Tester for insulation and Dielectric tests	MTOTN56 MJ270	SM005	06-10-23
High voltage insulation Tester up to 1 kV DC (megger)	CHAUVIN ANNOUX	SNV 1/785860	25-11-21
Torque wrench	US26	A30321301675	06-08-22
Multimeter	HTP200 HTIT200	93600 Jga	01-02-21
Ammeter Clamp	HT 9020 HTIT200	10073001	01-02-21

1.2. Documentation.

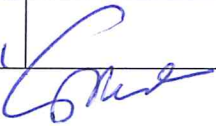
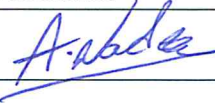
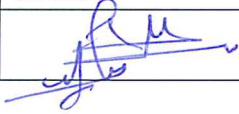
Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

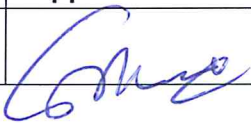
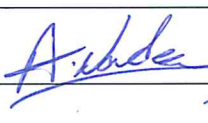
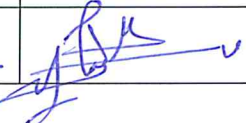
Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0001	R.4	LVSWG Overall Dimensions Panel Layout
01251-100-S07-E10-0001	R.5	LVSWG Single line diagram.
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0003	R.4	EPM Main Equipment Supplier Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

1.2.1. Documentation check

1.2.1	Documentation check				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 4.1 of the SAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.1 of the SAT procedure have to be present.			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					

2. GENERAL CONSTRUCTION CHECK

2.1.1	Terminal block connections.			
	Aim	Check the terminal block connections (wiring and tightening).		
	Pre-requisites	N.A.		
	Test description	Spot visual inspection and tightening test (with a screw driver).		
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: 01251-100-S07-E10-0001 LVSWG Single Line Diagram		
	Instrument	Screw driver.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

LVSWG Cleanliness of the equipment						
2.1.2	Aim	Check the cleanliness of the equipment.				
	Pre-requisites	Switchgear ready to be energized.				
	Test description	Visual inspection.				
	Acceptance criteria	The LV PMCC Switchgear is clean, dust has been removed and no tools are present in it.				
	Instrument	N.A.				
	Notes					
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier				Customer	Client
05-07-21						






**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



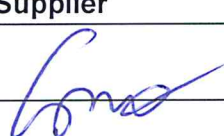
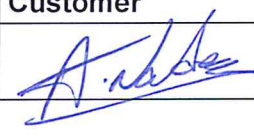

2.1.3	Mechanical and electrical interlocks			
	Aim	Check the functioning of the mechanical and electrical interlocks, door handle interlocks, key interlocks)		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The LVSWG arrangement must be in compliance with the following documents: 01251-100-S07-E02-0001 LVSWG Overall Dimension Panel Layout. 01251-100-S07-E10-0001 LVSWG Single line Diagram		
	Instrument	Operating handles, keys.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

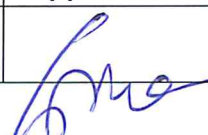
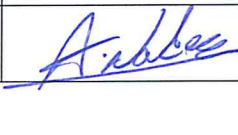
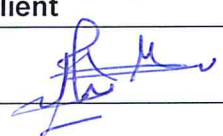
3. EQUIPMENT CHECK

3.1	Visual check of power and auxiliary equipment like circuit breakers, switches, relays, contactors, lamps (model / rating).			
	Aim	Check the correct selection, installation and wiring of the circuit breakers and switches.		
	Pre-requisites	N.A.		
	Test description	Visual inspection of electrical components.		
	Acceptance criteria	The LVSWG circuit breakers and switches must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

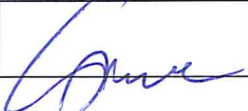


4. ELECTRICAL SAFETY CHECK

Insulation resistance test main circuits	
Aim	A measurement of the resistance of the main circuit shall be made in accordance to IEC 61439-1 Standard.
Pre-requisites	N.A.
Test description	The measurement shall be made with DC voltage MegaOhmeter by measuring the resistance across the terminals of each phase.
Acceptance criteria	Resistance value bigger than 10 Mohm. The measured value of the resistance shall be listed in the test report, as well as the general conditions during the test (current, air temperature, etc.) for future comparison.
Instrument	Type: CHAUVIN ARNOUX Mod.: CA 6505 S/N: 560167858P012 Test Certificate: F85012
Test results	$L1-B = 5,656 \Omega$ $L2-B = 3,866 \Omega$ $L3-B = 4,866 \Omega$ $W-B = 22,036 \Omega$
Notes	
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier
Customer	Client
05-07-21	

4.1.2	Dielectric test for main circuits.			
	Aim	Perform a dielectric test of the main circuits in accordance to IEC 61439-1 Standard.		
	Pre-requisites	N.A.		
	Test description	<p>Withstand voltage should be 2,5 kV ac for 5 seconds. The power-frequency voltage test shall be performed according to the IEC requirements.</p> <p>The test voltage shall be applied connecting each phase conductor of the main circuit in turn to the high-voltage terminal of the test supply,</p> <p>Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.</p>		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: <u>MOTN 4</u> Mod.: <u>M11170</u> S/N: <u>54005</u> Test Certificate: <u>3004-01</u>		
	Test results	<u>L1-G = 0,3 MA</u> <u>L2-G = 0,3 MA</u> <u>L3-G = 0,3 MA</u> <u>N-G = 0,3 MA</u>		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
<u>03-02-21</u>				

4.1.3	Dielectric test for auxiliary circuits.			
	Aim	Perform a dielectric test of the auxiliary circuits in accordance with CEI EN 61439-1 standard.		
	Pre-requisites	N.A.		
	Test description	Withstand voltage should be 1500 V ac for 5 seconds. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
	Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
	Instrument	Type: <u>MOTNEL</u> Mod.: <u>M.F.2270</u> S/N: <u>SM005</u> Test Certificate: <u>3006-01</u>		
	Test results	<p>KEBON Aux SUPPLY = $C = 0,2 \text{ nA}$ $W = 0,2 \text{ nA}$</p> <p>DOL Aux SUPPLY = $C = 0,4 \text{ nA}$ $W = 0,4 \text{ nA}$</p> <p>NOT 615 Aux SUPPLY = $C = 0,2 \text{ nA}$ $W = 0,2 \text{ nA}$</p> <p>Aux SUPPLY 230V = $C = 14,6 \text{ nA}$ $W = 23 \text{ nA}$</p> <p>Aux SUPPLY 110 VDC $+ = 0,2 \text{ nA}$ $- = 0,2 \text{ nA}$</p>		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

5. POWER SUPPLY CHECK

5.1.1	Main circuits Power supply				
	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: <u>HT 17504</u> Mod.: <u>HT 9200</u> S/N: <u>00600599</u> Test Certificate: <u>7564</u>			
	Measured voltage	Value	<u>400V</u>	Frequen cy	<u>50Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>					



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Auxiliary circuits Power supply					
5.1.2	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>HIT 1T34A</u> Mod.: <u>HIT3200</u> S/N : <u>98600509</u> Test Certificate: <u>7564</u>			
	Measured voltage	Value	<u>230V</u>	Frequency	<u>50Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Date	Supplier	Customer	Client		
	<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	



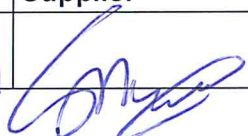
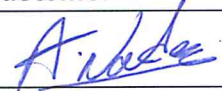
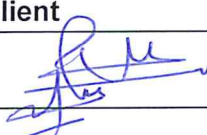
**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

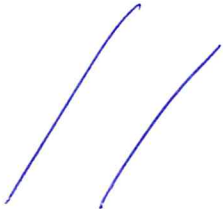
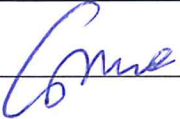
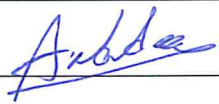
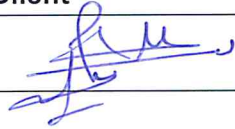


Heaters and Internal light				
Aim	Check the heaters power supply.			
Pre-requisites	Low voltage auxiliary power supply 230 Vac control circuits interconnected.			
Test description	N.A.			
Acceptance criteria	The heaters power supply voltage should be 230V 1P+N 50Hz.			
Instrument	Type: <u>MT 1704A</u> Mod.: <u>MT 8100</u> S/N : <u>Q8600502</u> Test Certificate: <u>7564</u>			
Measured voltage	Value	<u>230 V</u>	Frequen cy	<u>50/47</u>
5.1.3	Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>Cairo</u>	<u>A. Abdel</u>	<u>[Signature]</u>	

6. FUNCTIONAL TESTING.

6.1. Electrical equipment.

6.1.1	LVSWG power sections operating conditions.			
	Aim	Operation tests shall be made to ensure that the switching devices and removable parts and mechanical interlocks work properly.		
	Pre-requisites	N.A.		
	Test description	These tests shall be performed without voltage on or current in the main circuits.		
	Acceptance criteria	It shall be verified that: – the switching devices open and close correctly – each removable part can be inserted and removed correctly; – all interlocks work properly.		
	Instrument	HT ITOLA HT8200		
	Notes	//		
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

6.1.2	LVSWG withdrawable units operating conditions.				
	Aim	Check the functioning of the LVSWG withdrawable motor starters			
	Pre-requisites	N.A.			
	Test description	Check the mechanical and electrical functioning of the withdrawable units: <ul style="list-style-type: none"> • TEST mode; • REMOTE mode; 			
	Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram			
	Checked units				
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21					



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



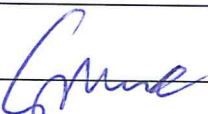
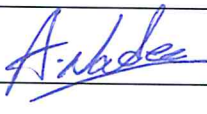
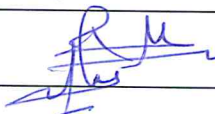
LVSWG withdrawable units operating conditions.				
6.1.3	Aim	Check the functioning of the LVSWG withdrawable feeders		
	Pre-requisites	N.A.		
	Test description	Check the mechanical and electrical functioning of the withdrawable units:		
	Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
	Checked units			
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21	Come	A. Abdel	[Signature]	



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Protection relays functional test.			
Aim	Check and test the protective relays by current injection on primary and secondary circuits.		
Pre-requisites	N.A.		
Test description	Inject the test current into the primary and secondary circuits of the Current Transformers and check the intervention of the relevant protection relays. Protection relays to be checked are the ones of the: <ul style="list-style-type: none">• LVSWWG Incoming sections;• LVSWG withdrawable units.		
Acceptance criteria	The protection relays intervention must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
6.1.4	Protection functions Tested	<i>As per FAT report</i>	
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>Comer</i>	<i>A. Abdel</i>	<i>R. M.</i>

6.1.5	Inter-changeability of electrically identical components.			
	Aim	Check the inter-changeability of electrically identical components.		
	Pre-requisites	N.A.		
	Test description	Change the position/assembling of electrically identical components.		
	Acceptance criteria	The system LVSWG must continue to work properly.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

7. COMMISSIONING and START-UP PROCEDURES

7.1. Preliminary operations.

Before starting-up the electrical and instrumentation commissioning of the M.C.C. all the erection activity have to be completed and all the followings point should be checked and confirmed.

7.1.1 Mechanical assembling check list.

	Check equipment' alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

7.1.2 Electrical connection check list.

	Check cabling connection	<input checked="" type="checkbox"/>
	Check the insulation resistance of the outgoing cabling before energising the loads	<input checked="" type="checkbox"/>

7.1.3 Checks without power supply.

Before energising the system, all the followings point should be checked and confirmed.

	Check the grounding connection of the MCC	<input checked="" type="checkbox"/>
	Check and set all the electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

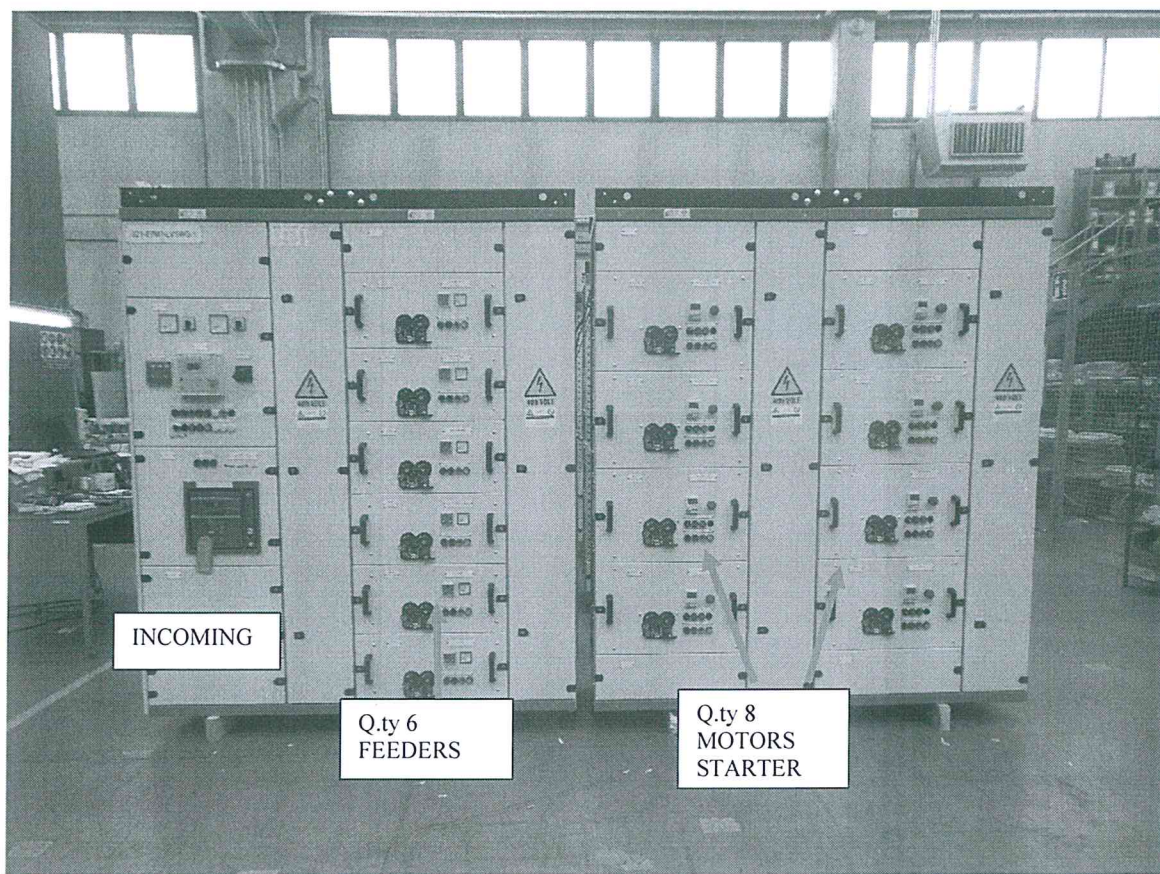
7.2.COMMISSIONING

Before starting the MCC energising sequence, all the Incoming Line Circuit breaker, the drawers main circuit breakers and the miniature circuit breakers must be previously opened.

MCC Power section commissioning/operating.

The MCC is supplied by one incoming line from transformer Tag 0XY-EPM(Z)-TR-1 400V 3ph +P + N (see fig. 1.1).

Fig. 1.1 – MCC Incoming Lines



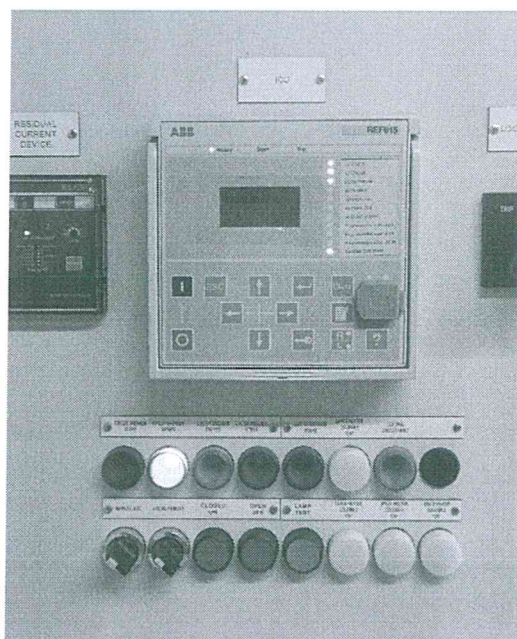
To start with the commissioning operation the LVSWG MMC shall be fed from the transformer 400 V 50 Hz 3P +N for power circuits and fed from the UPD panel for the auxiliary circuits 230V 50 Hz 1P+N.

7.3. INCOMING LINE SWITCH FUNCTION (column 1)

7.3.1. NORMAL OPERATION

MAIN INCOMING SWITCH ON- OFF COMMAND

The main switch can be commanded in the following mode by the selector switch and operators installed on the auxiliary command panel of the incoming column of the MCC. (see picture below)



Selector switch 30SA1 “Manual-Automatic” function

- Manual position defines the switch command by Local command from the MCC
- Automatic position defines the switch command by the control relay REF 615.

Selector switch 30SA2 “Local-Remote” function

- Local position defines the command switch by the start/stop pushbutton installed on the command panel
- Remote position defines the command switch by the command from DCS Enppi

Local Operation sequences:

- Turn the selector switch 30SA1 in Manual position
- Turn the selector switch 30SA2 in Local position
- Press the pushbutton 30SB1 for “Close” command
- Press the pushbutton 30SB2 for “Open” command



Remote Operation sequences:

- Turn the selector switch 30SA1 in Automatic position
- Turn the selector switch 30SA2 in Remote position
- The command "Closed" from DCS command the closing of switch
- The command "Open" from DCS command the opening switch

Automatic Operation sequences:

- Turn the selector switch 30SA1 in Automatic position
- The "Close" command is generated from the relay REF 615
- The "Open" command is generated from the relay REF 615

7.3.2. POWER SUPPLY LOSS

The main incoming switch shall open due to under voltage protection (F27) controlled by protection relay REF615 (27A1)

The main switch of the feeder drawer shall remain closed

The main switch of the DOL drawer shall remain closed, motor contactor contactors shall open if under voltage continue more than 4.5 seconds.

7.3.3. POWER RESTORATION

The main incoming switch shall be closed in one of the way indicated in the point 1
Local, Remote or Automatic

If the motor contactor open, due to power loss for more than 4.5 seconds,) can be restarted manually from the local control station (Local Start/Stop) or from the DCS command (Start/Stop contact).

See point 8.3 DOL drawer

7.4. LVSWG MCC Columns

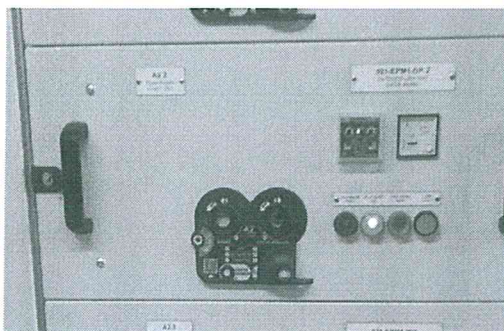
7.4.1. Drawer feeder commissioning/operating (column 2)

The drawer feeder column 2 is equipped with:

- Q.ty 5 Type F 4 poles drawers for feeder 100A
- Q.ty 1 Type F 3 poles drawers for feeder 63A

Front Drawer feeder type F (3 & 4 poles) see below picture

- PA80A Ammeter;
- 84SB1, Lamp Test blue push-button
- 84HL1, Green signal lamps (Circuit breaker open)
- 84HL2, Red signal lamps (Circuit breaker closed)
- 84HL3, Yellow signal lamps (Circuit breaker tripped on fault)
- 82A1, Residual current monitor






The feeders are connected according to the doc. 01251-100-S07-E10-0001

Test sequence

Check that the MCC is energized	<input checked="" type="checkbox"/>
Insert the drawer	<input checked="" type="checkbox"/>
✓ Check the correct function of the signal lamps by pushing the:	<input checked="" type="checkbox"/>
✓ 84SB1 Lamp test push button	<input checked="" type="checkbox"/>
✓ 84HL1, Green signal lamps (Circuit breaker open)	<input checked="" type="checkbox"/>
✓ 84HL2, Red signal lamps (Circuit breaker closed)	<input checked="" type="checkbox"/>
✓ 84HL3, Yellow signal lamps (Circuit breaker tripped)	<input checked="" type="checkbox"/>
✓ 82A1, Residual current monitoring check	<input checked="" type="checkbox"/>

Service sequence

Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	
Remove the key from the left side rotary handle	
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the feeder is now operating	

See attachment Lafer ME_CUB ITA ENG manual drawer operation

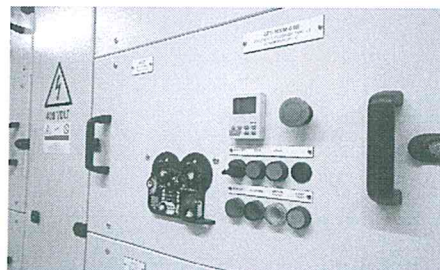
7.4.2. DOL drawer commissioning/operating (column 3 and 4)

The DOL drawer column 3 and 4 is equipped with

- Q.ty 4 Type M 3 poles drawers DOL motor starter > 7,5 kW and <75kW

Front DOL Drawer type M (3 poles) Motor starter > 7,5 Kw and <75kW see below picture

- **53SA1**, TEST-OFF-REMOTE black selector switch with 3 maintained position.
- **53SB2**, STOP red push-button
- **53SB3**, START green push-button
- **55SB1**, Lamp Test blue push-button
- **55HL1**, Red signal lamps (RUN - MOTOR ON)
- **55HL2**, Green signal lamps (STOP- MOTOR OFF)
- **55HL3**, Yellow signal lamps (MOTOR FAULT)
- **53SB1**, Mushroom Emergency stop push button



Motor starter drawer are connecting in according the doc. 01251-100-S07-E10-0001

DOL motor starter is equipped with:

- **QF50.1**, LV moulded case circuit breaker
- **UMC100.3 UC** controller with UMC panel LCD DISPLAY

Test sequence

Check that the MCC in energized	<input checked="" type="checkbox"/>
Insert the drawer	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> ✓ Check the correct function of the signal lamps by pushing the: ✓ 55SB1 Lamp test push button ✓ 55HL1, Green signal lamps (Circuit breaker open) ✓ 55HL2, Red signal lamps (Circuit breaker closed) ✓ 55HL3, Yellow signal lamps (Circuit breaker tripped) 	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<p>Turn in "TEST" position the selector switch 53SA1 to TEST the control circuit UMC100.3 (contactor closed → no power on the outgoing clamps)</p> <ul style="list-style-type: none"> ✓ Check the status of the UMC100.3 ✓ 55HL2, green lamp "ON" means contactor open (Motor off) ✓ 55HL1, red lamp "ON" means contactor closed (Motor on) ✓ 55HL3, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault 	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<p>By the push button installed on the front of the drawer is possible to command the motor contactor:</p> <ul style="list-style-type: none"> ✓ 53SB1 Mushroom Stop pushbutton (emergency Stop) ✓ 53SB3 Start command ✓ 55HL1, red lamp "ON" means contactor closed (Motor on) ✓ 53SB2 Stop command ✓ 55HL2, green lamp "ON" means contactor open (Motor off) ✓ 55HL3, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault 	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation

**CRUDE OIL TANK FARM
1251-100****EPM MODULE****HVAC****Pre commissioning and Commissioning****Site Integration Test Procedures****AGROOD****030-EPM-04**

2	07/12/2020	Approval	BP	LS	GA		
1	17/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-16-7				
			Enppi Ref.: 01251-100-S07-P06-0005 R.2				
					Language: E		Total Pages: 17
This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

CRUDE OIL TANK FARM	1
1 INTRODUCTION PRECOMMISSIONING AND COMMISSIONING PROCEDURE	3
2. DOCUMENTS.....	4
2.1 SYSTEM DESCRIPTION.....	5
3 PRECOMMISSIONING AND COMMISSIONING PROCEDURE	6
3.1 INTRODUCTION	6
3.2 REFERENCE DOCUMENTS.....	6
3.4 TECHNICAL STRATEGY	6
3.5 COMMISSIONING PRE-REQUISITES	6
4 HEALTH, SAFETY AND ENVIRONMENT.....	7
5. PRE-COMMISSIONING AND COMMISSIONING REQUIREMENTS	7
6 PRE-COMMISSIONING & COMMISSIONING	9
6.1 PRELIMINARY CHECKS	9
6.2 TEST OF FIRE DAMPER	9
6.3 TEMPERATURE/HUMIDITY TRANSMITTER TEST	9
6.4 PRESSURE SWITCH TEST	10
6.5 HVAC UNITS TEST	10
6.6 EXHAUST FANS TRANSFORMER ROOM.....	12
6.7 AIR DUCT DISTRIBUTION	13
7.0 PERFORMANCE TEST AND AIR BALANCING	14
8.0 PRELIMINARY ACTIVITIES COMMON FOR ALL EPM	16
9.0 RECORDING.....	17

1 INTRODUCTION PRECOMMISSIONING AND COMMISSIONING PROCEDURE

The Precommissioning and Commissioning and Site Integration Test Procedures consists in 2 documents which are to be used to proceed in the final commissioning at site.

Personnel involved in the Site Integration Test

The table below shows the people who participate at the activity of the Commissioning and Site Integration Test: the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Nour Ahmed	ENPPI	<i>Nour</i>	13/07/2021
	ENPPI		
Giovanna Pala	CEAR	<i>Giovanna Pala</i>	13/07/2021
	CEAR		

2. DOCUMENTS

Following a list of the relevant documents may be used to perform the Precommissioning and Commissioning Test (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-C03-0001	R.7	HVAC and Pressurization System Calculation
01251-100-S07-C04-0001	R.4	HVAC Catalogues and data sheet
01251-100-S07-C99-0005	R.7	External Static Pressure calculation for fans
01251-100-S07-C99-0006	R.3	HVAC SYSTEM FAT & SAT
01251-100-S07-D99-0004	R.5	HVAC Drawing Plan Layout
01251-100-S07-D99-0015	R.6	HVAC Roof Top General Arrangement
01251-100-S07-E10-0005	R.4	HVAC Roof Panel Single & Wiring Diagram
01251-100-S07-E10-0006	R.4	HVAC Contr. Panel Single & Wiring Diagram
01251-100-S07-K09-0001	R.6	EPM Main Eq. Data Sheet HVAC
01251-100-S07-K07-0001	R.4	HVAC Schematic Flow Diagram
01251-100-S07-K15-0001	R.2	HVAC Material Safety Data Sheet
01251-100-S07-C99-0007	R.3	Start up form and operation guide

2.1 SYSTEM DESCRIPTION

The shelters are air conditioned and ventilated by means of a Packaged air conditioning units Roof Top type (RT-A & RT-B), constant air volume, with built-in electrical heating coil. These units are provided redundant such that in case of failure of duty unit, the 100% capacity stand-by unit starts and guarantee the required building design conditions.

Each Roof Top unit is equipped with onboard panel complete with signal lamps multi led type and selector switch.

Each electrical component is protected by automatic breaker located in the switchboard.

Each Roof Top unit is it is equipped with a motorized exclusion dampers.

Cooling or heating system are controlled through the temperature set points that can be set on the operator panel HMI located in the main control panel in electrical room.

Fresh air intake completes with sand trap louver with wire mesh installed on the common plenum duct.

Fresh air intake motorized volume damper installed on each Roof Top units.

The room differential overpressure is monitored from the HMI panel by a pressure transmitter installed in the electrical room.

Transformer room is provided with two exhaust fans (EXF-01 and EXF-02), one duty and one in stand-by.

Duct crossing the fire rated wall cut-outs are provided with a combination of motorized fire & smoke isolation dampers.

RT-A(duty) and RT-B (stand-by) shall have an operating cycle of 7 days interval.

In case of the stand by RT shall be isolated for maintenance (opening the main breaker on the onboard panel or main breaker on the main LCP panel) the HMI system will see a malfunction and RT on duty shall continue to run until breaker malfunction reset of stand-by unit.

When a RT unit is commanded at the start the onboard motorized dampers will open.

When a RT unit is in stop the onboard motorized dampers are closed.

In normal condition each RT units shall be ready to work at any time (400V 3ph+N).

When the LCP panel commands the system to shut down, both operating and stand-by RTs shall stop also all motorized dampers (onboard and F&G dampers) shall close, system reset shall be done manually when the alarm has been cleared.

In case of equipment failure or any HVAC alarm signals an audible alarm shall be initiated and visual indication shall be displayed al LCP panel.

Audible alarm shall have the provision to be mute silenced, however visual alarm shall last until fault is attended and reset.

3 PRECOMMISSIONING AND COMMISSIONING PROCEDURE

3.1 INTRODUCTION

The purpose of this HVAC test procedure is to provide guidelines to ensure that all installed HVAC equipment is tested in a safe and controlled manner whilst confirming compliance with building requirements and design intent.

3.2 REFERENCE DOCUMENTS

01251-100-510-16-7-E10-005	HVAC System On board Control Panel
01251-100-510-16-7-E10-006	HVAC System Main Electrical Control Panel
01251-100-S07-E99-0003	HVAC Control philosophy & logic diagram
01251-100-S07-K07-0001	HVAC and pressurization system Schematic flow Diagram
01251-100-S07-E99-0004	HVAC AND PRESSURIZATION SYSTEM Electrical load list

3.4 TECHNICAL STRATEGY

Prior to carrying out any HVAC testing mechanical completion of all construction activities for any given system must be complete with all installation and testing certification correctly completed as per ACS requirement. In addition to this any control systems required to allow completion of a HVAC test must have been successfully Site Acceptance Tested with a mechanical completion handover accepted. The action of ESD signals will be tested during ESD Cause & Effect checks. So, all activities related to F&G and ESD tests are not considered in this procedure. And they will be described in the relevant commissioning procedures.

Recommended personnel to execute HVAC tests:

- HVAC tests will be the overall responsibility of the CEAR commissioning team.
- It is envisaged that a third-party contractor will provide commissioning teams (Engineers, Senior Technicians and Technicians) to carry out pre-commissioning of the HVAC. These personal will be an integrated part of the CEAR commissioning team.
- Commissioning technicians will be positioned in the field, liaising with Control room Technicians via radio.
- Full time Vendor and EC / or systems support will also be required on site.

3.5 COMMISSIONING PRE-REQUISITES

- Mechanical Completion of sub-system has taken place and has been custody transferred to the commissioning team.
- Commissioning of F&G system is completed prior to energization of HVAC system.
- All necessary Permits to Work are prepared by EC and ready to implementation.
- The job pack is complete and available for inspection.

The job pack shall contain:

- "As built" by Construction loop sheet (if applicable);
- Data sheet;
- Relevant HVAC equipment or Instrument check sheet;
- Calibrated measurement devices;
- Updated calibration certificates for the measurement devices.

4 HEALTH, SAFETY AND ENVIRONMENT

General Requirements

When implementing the loop check each employee involved in commissioning process shall be aware of and strictly comply with all internal CEAR Safety instructions

All personnel shall be familiarized with the plan of the works to be implemented. Also, they shall know the actions and means of notification upon occurrence of emergencies.

All personnel shall be provided with the standard personal protective equipment (PPE). All the fire detection and fire-extinguishing equipment shall be checked to ensure it is an operational condition.

Prior to the commencement of HVAC testing each commissioning engineer involved shall ensure there is adequate lighting, safe access and exit, fire-fighting equipment and communications provided and that the area is clear of debris.

All necessary permits to work (PTW) shall be completed and approved prior to work starting.

No work will be undertaken, regardless of the urgency, unless it fully complies with all the site safety procedures and environmental procedures.

Erect barriers and signs around test areas prohibiting entry of unauthorised and non-test personnel

Precautions and Equipment required

- All personnel shall be familiarized with the plan, procedures and regulations applicable to this type of work.
- Proven suitable tools shall be used.
- Work crew consisting of, at least, 2 people shall work in the field.
- Stable radio communication shall be provided.

5. PRE-COMMISSIONING AND COMMISSIONING REQUIREMENTS

Commissioning Consumables

- Barrier tapes (caution/ no entry/danger).
- Caution and warning labels and signs.
- Cleaning materials (Cleaning cloths, lint free).

Tools and Test Equipment with the relevant calibration test certificate

- Hand tools.
- Radio.
- Daily recorder of temperature and humidity.
- Digital thermo hydrometer.
- Air flow meter.



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



- Windmill anemometer.
- Clamp-on ammeter.

Manpower

- Test engineer – in charge and supervises work of the team.
- HVAC technicians – work with Instrument devices and HVAC equipment in the field.

Vendor requirement

Full time Cear/Frigotermica technicians and / or systems support shall also be required on the site.

Method Statement

This section below gives specific details and guidelines for HVAC test. The manufactures vendor manuals could be used for additional information.

Method statement includes some main sections as follows:

- Loop check of instruments such as dampers, transmitters, valves.
- Dynamic performance test and air balancing.

6 PRE-COMMISSIONING & COMMISSIONING

6.1 PRELIMINARY CHECKS

No	Action	ITEM Positive/ Negative	Signature	Date
01	Duct work inspection to check duct sealing	P		
02	Check control panel installation and cable termination	P		
03	Check the panel is fully energize	P		
04	Check the HMI in MCC room	P		
05	Check the sequence of operation (appendix 1)	P		

6.2 TEST OF FIRE DAMPER

No	Action	ITEM Positive/ Negative	Signature	Date
01	Carry out a visual check of the FD to ensure that is correct: <ul style="list-style-type: none"> Tagging mounting, cable installation cable termination and grounding 	P		
02	Command to open the electric FD	P		
03	Ensure that deenergized FD is in normally closed position	P		
04	Check the position indication (micro switch) that HVAC main control panel is receiving from damper actuator indicating the FD position	P		

6.3 TEMPERATURE/HUMIDITY TRANSMITTER TEST

No	Action	ITEM Positive/ Negative	Signature	Date
01	Carry out a visual check of the instrument to ensure the tagging, mounting, cable installation, cable termination and grounding is correct, spare entries are correctly plugged. Ensure that PLC HMI screens display fault signal for this not energized transmitter.	P		
02	Energize the instrument in HVAC PANEL for relevant transmitter. Ensure that the instrument is powered up and the point is active on the PLC HMI screens.	P		

6.4 PRESSURE SWITCH TEST

No	Action	ITEM	Signature	Date
		Positive/ Negative		
01	Carry out a visual check of the instrument to ensure all tagging, mounting, cable installation.	P		
02	Connect multi-meter to the instrument. Apply the pressure, slowly raising if checking of high-pressure set-point (PDSH) and slowly lowering if checking of low pressure set-point (PDSL). Record pressure value when relay activates.	P		

6.5 HVAC UNITS TEST

No	Action	ITEM	Signature	Date
		Positive/ Negative		
01	Carry out a visual check of the indoor and outdoor unit to ensure the tagging; mounting; instruments, cables, installation, cable termination and grounding is correct, there are no any mechanical damages.	P		
02	Make sure the refrigerant status indicator (sight glass) indicates the normal condition of refrigerant. If it indicates abnormal condition it is required to replace refrigerant involving commissioning mechanicals and support of construction people.	P		
03	Run axial fans installed in outdoor condensing unit. Check sense of rotation. Energise electrical crankcase heater of compressor lube oil. The minimum period recommended for energizing oil heater prior to start up the compressors is 6 hours.	P		
04	Check the refrigerant pressure gauge	*		

13/7/2021

Yda Guevara
13/07/2021

* CEAR rep hasn't brought the pressure gauge to check the refrigerant pressure, However the two MIC (Rt-A/B) have been properly worked during the commissioning activity and there is no alarm for low pressure or high pressure.

No	Action	Positive/ Negative	Signature	Date
05	Start the unit and provide its run-in during 8 hours prior to fill in the check sheets. Measure the electrical parameters, pressure and temperature of evaporator & condenser, compressor oil level. All the measured parameters should not exceed limits specified in operation and maintenance manual.	P		
06	Check the interlock and intervention of following protection: refrigerant high-pressure switch refrigerant low-pressure switch lube oil low pressure switch	P		
07	Check the correct operation of inverter controlling the condenser fan speed via pressure transmitter installed on refrigerant piping	*		
08	Check total static pressure through the unit	**		
09	Check equipment noise	P		
10	Check equipment and air duct vibration	P		
11	Measurement that denotes the equipment cooling capacity (such as air temperature in/out, humidity and flow rate)	P		
12	Check the equipment vibration	P		

* No Inverter Provided and No need for it

** Ceat rep advised that the static pressure has already been achieved because of the flowrate required by design already achieved and has been verified by measurements during the commissioning activity.

Nam
13/07/2021

Rola Gouamha
13/07/2021

Measured Data

1- Roof top -A (RT-A)

Motor	Current (A)			Rated current (A)
	A	B	C	
Supply fan	2.7	2.6	2.6	3.8
Compressor-01	5.4	5.4	5.4	11.1
Condenser fan-01	0.9	0.9	0.9	1.1
Compressor-02	5.2	5.4	3.4	11.1
Condenser fan-02	0.9	0.9	0.9	1.1
Electric heater	8.4	8.5	8.4	8.6

1- Roof top -B (RT-B)

Motor	Current (A)			Rated current (A)
	A	B	C	
Supply fan	2.5	2.7	2.6	3.8
Compressor-01	5.4	5.4	5.3	11.1
Condenser fan-01	0.9	0.9	0.9	1.1
Compressor-02	5.5	5.6	5.4	11.1
Condenser fan-02	0.9	0.9	0.9	1.1
Electric heater	8.5	8.5	8.6	8.6

Nour Ahmed
Nour

13/07/2021

Giovanna Pda

13/07/2021

6.6 EXHAUST FANS TRANSFORMER ROOM

“EXF-A” & “EXF-B”

INSPECTION RESULTS

1- Correct installation	<u>OK</u>
2- Fastener	<u>OK</u>
3- Functional control	<u>OK</u>
4- Air passage	<u>OK</u>
5- Damages	<u>OK</u>
6- Accessories	<u>OK</u>
7- Grounding	<u>OK</u>
8- Rotation sense	<u>OK</u>
9- Setting of thermic relays	<u>OK</u>

Measured data:

A) Exhaust Fan motor

	current (A):			Rated current
Fan #1	1a) <u>0.9</u>	1b) <u>0.9</u>	1c) <u>0.9</u>	<u>1.06</u>
Fan #2	2a) <u>0.9</u>	2b) <u>0.9</u>	2c) <u>0.9</u>	<u>1.06</u>

NOTE

Not
13/07/2021

Pda Gouern
13/07/2021

6.7 AIR DUCT DISTRIBUTION

OPERATIONS DESCRIPTION

- | | |
|--|----|
| 1- Open setting dampers | OK |
| 2- Open fire-dampers | OK |
| 3- Open dampers, grilles | OK |
| 4- Verify internal cleaning | OK |
| 5- Before start the fans cover delicate instruments | OK |
| 6- After fans start up verify there aren't air losses | OK |
| 7- Verify and check the integrity of the thermal insulation and outer cladding | OK |
| 8- Perform Factory air duct leakage type test for one EPM | OK |

OPERATIONS DESCRIPTION

Measure with windmill anemometer the regular air distribution at the exit of the diffusers and on the return grills in conformity with the documents:

GRILLE	Location	velocity Flow-rate Measure n.1 m/s	velocity Flow-rate Measure n.2 m/s	velocity Flow-rate Measure n.3 m/s	ow. velocity Flow-rate Measure n.4 m/s	Flow rate
Return grille	Floor	0.5 0.6	0.5 0.7	0.7 0.7	0.62	226 L/s
Return grille	Floor	0.5 0.5	0.6 0.6	0.7 0.5	0.56	200 L/s
Supply Diffuser grille	ELEC. room	2.5	2.7	3.4	2.8	215 L/s
Supply Diffuser grille	ELEC. room	1.7	2.2	2.8	2.23	167 L/s
Supply Diffuser grille	ELEC. room	2.8	3.2	3	3	225 L/s
Supply Diffuser grille	ELEC. room	2.6	3.2	3.3	3	225 L/s
Supply Diffuser grille	Air lock	2.7 0.9	2.7 0.9	2.67	1.98	100 L/s

Tolerance accepted +/- 10 %

for
13/07/2021

Pda Giovanni
13/07/2021

7.0 PERFORMANCE TEST AND AIR BALANCING

Air balancing will be performed in order to regulate air flow between the following manual dampers:

Air supply to MCC room

Air supply to Air lock

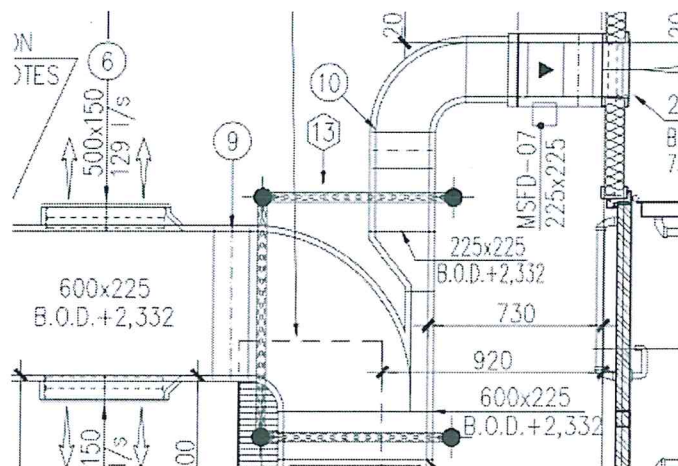
Fresh air intake

By modulating the below manual dampers refer to the drawing and document:

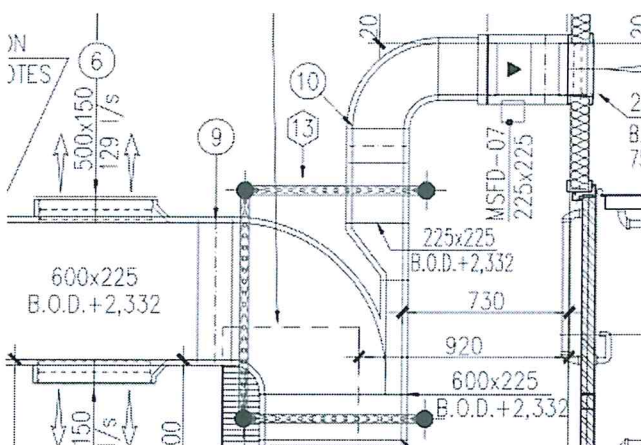
01251-100-S07-C04-0001 HVAC Catalogues and Data Sheet

01251-100-S07-D99-0004 HVAC Drawing Plan Layout

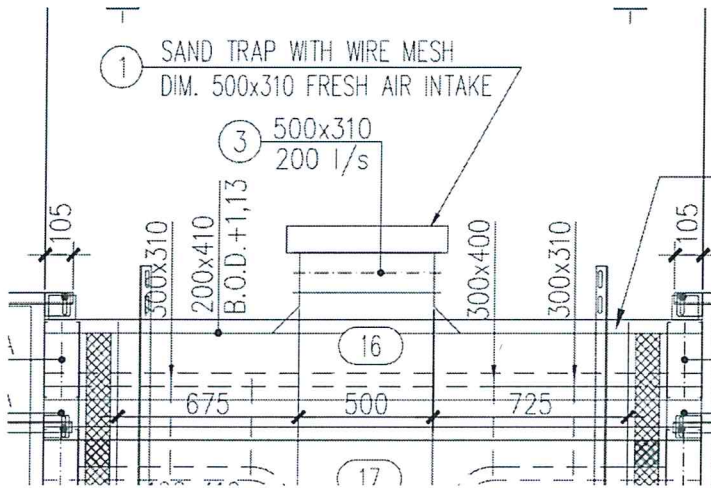
1. MCC room – manual damper pos. 9



2. Air lock – manual damper pos. 10



3. Fresh air intake – manual damper pos. 3



Performance test shall be executed only after system commissioning. If the air conditioning system will be started after a period of stand-by, the temperature performance test shall start after about 12 hours of operation.

8.0 PRELIMINARY ACTIVITIES COMMON FOR ALL EPM

Action common for both summer and winter test

Note: Final actual performance test shall be done during the peak summer time

BLDG				
No	Action	Positive/ Negative	Signature	Date
1	During indoor temperature monitoring, install the inspected thermo hydrometer at 1m from floor level in position not damaged directly from the main heat gains. If HVAC system required temperature transmitter within the room subject of the test, locate thermo hydrometer as close as possible to it	P		
2	Check that all doors are closed and openings are sealed.	P		
3	Record the readings of thermo hydrometer for 12 hours.	P		
4	Check the internal and external temperature with manual thermometer (set) every 2 hours noting all the results (not in the night hours).	P		
5	Ensure that during these operations the doors shall be closed and opened only upon approval of involved technicians.	P		
6	Set in Automatic mode all HVAC control system	P		
7	Ensure that all internal wall dampers (FD) and external wall dampers are opened (not applicable for damper of the smoke exhaust duct)	P		
8	For the units that are dual and redundant. Simulate failure of working unit and make sure that stand-by unit is entering in operation.	P		
9	Simulate a fire and gas scenario	P		
10	Simulate that two units are down	P		
11	Overall control system performance in control of dampers, temperature, safety and emergency logic. Indoor overpressure	P		

Nour Ahmed
Nour
13/07/2021

Pda Ghanem
13/07/2021

9.0 RECORDING

RECORDING WITH TERMOMETER DATA LOGGER

TIME	8,00	10,00	12,00	14,00	16,00	18,00	20,00	22,00	24,00	2,00	4,00	6,00
			1:30	2:00	3:00	3:30	4:00	4:30				

INDOOR TEMP. °C.			24.3	23.6	23.8	25	23.5	25				
INDOOR HUMIDITY rh%			36.5	44	36	34.3	35	44				
OUTDOOR TEMP. °C			41.8	45	45	45	45	45				
OUTDOOR HUMIDITY rh%			13.3	11.3	10.5	9.5	9.5	9.5				
SUPPLY AIR FLOW RATE READING [m ³ /h]			932	932	932	932	932	932				
RETURN AIR FLOW RATE READING [m ³ /h]			426	426	426	426	426	426				
INTERNAL OVERPRESSURE READING [Pa]			25	25	25	25	25	25				

SPOT MANUAL TEMPERATURE READING (EVERY 2 HOURS)

TIME	8,00	10,00	12,00	14,00	16,00	18,00
		1:00	2:00	3:00	4:00	
INLET TEMP. SWIT. ROOM		24.3	23.6	23.8	23.5	
INLET TEMP. TRAFO ROOM		33.5	33.5	33.5	33.5	

Test result:

☒ Positive

☐ Negative

☐ With reserve

Technician: Giovanni Polo

Sign: Giovanni Polo Date: 13/07/2021


Client: M. Saleh

Sign: Nour Ahmed Date: 13/07/2021

Nour Ahmed

Nour

13/07/2021

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC ~ THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0001 R.1				
					Language: E		Total Pages: 19
This document is the property of Enppi It must not be stored, reproduced or disclosed to others without written authorization from the COMPANY							

INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document	3
TESTING STRATEGY	3
Safety precaution	3
Personnel involved in the SAT	4
Section 1: EPM DESIGN & FABRICATION	4
DESCRIPTION OF THE TESTS	4
1.1 Documentation	5
1.2 Visual Check	7
Section 2: EPM ELECTRICAL INSTALLATION	8
DESCRIPTION OF THE TESTS	8
Personnel involved in the SAT	8
2.1 Documentation.	9
2.2 Internal and External Lighting system	10
Section 3: EPM LIGHTNING SYSTEM	13
DESCRIPTION OF THE TESTS	13
Personnel involved in the SAT	13
3.1 Documentation.	14
3.2 Lightning System	15
Section 4: EPM MCT Multicable Transition System	17
DESCRIPTION OF THE TESTS	17
Personnel involved in the SAT	17
4.1 Documentation.	18
4.2 MCT FRAME	19





**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



INDEX

INTRODUCTION SAT PROCEDURE.....	3
Aim of the Document.....	3
1.1 Personnel involved in the SAT	3
1.2 DOCUMENTATION	4
2. TESTING STRATEGY.....	4
3. INSTALLATION TESTING.....	5
3.1 Documentation check.....	5
3.2 INSTALLATION CHECK.....	6
3.3 POWER SUPPLY CHECK.....	8
4. FUNCTIONAL TESTING.....	9
4.1 Electrical equipment.....	9
5 COMMISSIONING AND START-UP PROCEDURES DP 1.....	10
5.1 Preliminary operation.....	10
5.1.1. Mechanical assembling.....	10
5.1.2 Electrical / Instrument connecting.....	10
5.1.3 Check and Test with Voltage supply.....	10
5.1.4 Test the circuit one by one and not at the same time.....	11

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Indoor DP-1 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-1 Panel

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and SAT Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Kadeem	ENPPI		5/7/2021
H. Ibrahim	PPC		5/7/2021
COTR COTTIN FABIO	CEAR		05-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0002	R.4	Indoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0002	R.4	Indoor Panel Single & Wiring diagram.
01251-100-S07-K11-0007	R.4	EPM Filled in DP-1 Indoor Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY



The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.



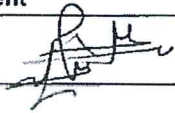
The **Functioning** testing phase is developed to test the functioning of the:



- Electrical equipment;

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

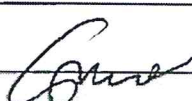
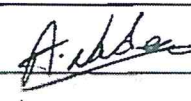

3. INSTALLATION TESTING

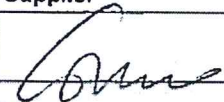
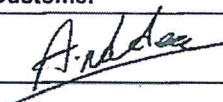

3.1 Documentation check.

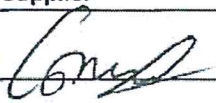
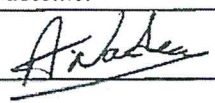
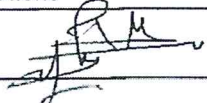
3.1	Documentation check.			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

3.2 INSTALLATION CHECK

3.2.1	DP-1 Indoor Distribution Panel			
	Aim	Check the DP-1 identification label.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The DP-1 identification label must be in compliance with the following documents: 01251-100-S07-E10-0002 Indoor Panel Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

3.2.2	DP-1 Indoor Distribution Panel Front lay-out			
	Aim	Check the front DP-1 layout.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria	The front layout must be in compliance with the following documents: 01251-100-S07-E10-0002 Indoor Panel Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout.		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-1 arrangement must be in compliance with the following documents: 01251-100-S07-E10-0004 UPS Single Line Diagram 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



3.3 POWER SUPPLY CHECK

Main circuits Power supply			
Aim	Check the main circuits power supply.		
Pre-requisites	N.A.		
Test description	Check the presence and the value of the main power supply voltage.		
Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.		
Instrument	Type: HT 17340 Mod.: HT 3200 S/N: 88600509 Test Certificate: 2544		
Measured voltage	Value	400V	Frequency 50 Hz
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	Conc	A. Abdel	R. H.

Auxiliary circuits Power supply			
Aim	Check the auxiliary circuits power supply.		
Pre-requisites	N.A.		
Test description	Check the presence and the value of the auxiliary power supply voltage.		
Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.		
Instrument	Type: HT 17340 Mod.: HT 3200 S/N: 88600509 Test Certificate: 2544		
Measured voltage	Value	230V	Frequency 50 Hz
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	Conc	A. Abdel	R. H.

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

Customer: ENPPI

Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.


The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's
- Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.

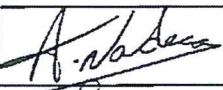


We will describe the company safety rules and the rules to be followed while attending the test.

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Almeh Abdelmonem	ENPPI		5/7/2021
M. Doshan	PPC		5/7/2021
COTTE COTTE FABIO	CEAR		05-07-21
	CEAR		

Section 1: EPM DESIGN & FABRICATION

DESCRIPTION OF THE TESTS

Visual test

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting & Coating Check

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check

Identification and Marking Check will be performed to verify the correct nameplate of the EPM Module



1.1 Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).



Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-B04-0001	R.5	EPM Foundation Drawings
01251-100-S07-B05-0001	R.2	EPM Doors drawing and fire rating
01251-100-S07-B05-0002	R.1	EPM False floor and fire rating
01251-100-S07-B05-0003	R.1	EPM Roof Accessibility
01251-100-S07-B05-0005	R.1	EPM Sandwich Walls Panel-Internal Partition
01251-100-S07-D01-0001	R.3	EPM Detail Design Fabrication Drawings
01251-100-S07-P05-0001	R.4	Surface Preparation Painting & Coating Procedures
01251-100-S07-D04-0001	R.2	EPM Nameplate format drawing
01251-100-S07-D99-0003	R.2	Transformer Dragging System Layout
01251-100-S07-D99-0001	R.2	EPM Lifting Pad Eyes Layout
01251-100-S07-D99-0002	R.2	EPM Centre of gravity Location Layout



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**





Documentation check			
Aim	Check the presence of the project documentation.		
Pre-requisites	N.A.		
Test description	Check the presence and the state of the documentation listed on chapter 1.2		
Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

1.2 Visual Check

1.2	Visual Check				
	Aim	Visual check of the good construction of the EPM			
	Pre-requisites	N.A.			
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.			
	Acceptance criteria	Visual test and relevant photo			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
05-07-21	<i>Com</i>	<i>A. Abdel</i>	<i>[Signature]</i>		

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

Section 2: EPM ELECTRICAL INSTALLATION

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship

Internal and External Lighting System

Visual test and functional test will be performed as per the relevant documentation

Electrical Safety Check Lighting System

Safety check insulation and dielectric test

Internal raceway and EPM wiring

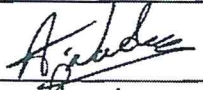


Visual inspection of the raceway and internal EPM wiring

Identification and Marking Check

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

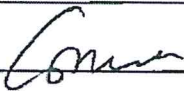
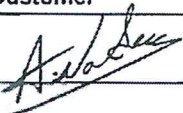

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Abdelmonem	ENPPI		5/7/2021
M. Ibrahim	PPC		5/7/2021
COTI COTI LAMLO	CEAR		25-07-21
	CEAR		

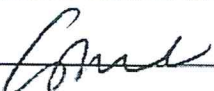
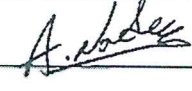

2.1 Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-E99-0008	R.3	Lighting and Small Power System Electrical Layout
01251-100-S07-E99-0011	R.4	Cable Routing Power & Lighting Layout
01251-100-S07-C99-0001	R.3	Lighting Lux Level Calculation
01251-100-S07-K09-0004	R.4	EPM Ancillaries Supplier Data Sheet

2.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 2.1.		
	Acceptance criteria	All the documentation listed on chapter 2.1 Section 2 of the SAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

2.2 Internal and External Lighting system

2.2.1	Internal and External Lighting Fixtures and Small Power system layout			
	Aim	Verify the installation of the fixtures and the small power system of the EPM Module.		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the values reported on the following documents: 01251-100-S07-E99-0008 Lighting and Small Power System Layout 01251-100-S07-D99-0011 Cable routing Power & Lighting Layout 01251-100-S07-K09-0004 Ancillaries supplier data sheet		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**




Internal and External Lighting Fixtures Functional Test			
Aim	Verify the proper operation of the internal and external EPM lighting system.		
Pre-requisites	Energize the indoor and outdoor distribution boards with 400 V 3P+N		
Test description	The test must be in compliance with the following documents: 01251-100-S07-E99-0008 Lighting and Small Power System Layout 01251-100-S07-K09-0004 Ancillaries supplier data sheet 01251-100-S07-E10-0002 Indoor Panel Single Line diagram 01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram 01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout 01251-100-S07-C99-0001 Lighting Lux level Calculation		
Acceptance Criteria	Single Test of the various lighting circuit as defined in the electrical documentation. Check the correct function of the emergency light fixtures external and internal Check the correct function of the twilight switch and the emergency line circuit		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Small Power system Functional test			
Aim	Verify the proper operation of the internal and external EPM receptacles		
Pre-requisites	Supply the indoor and outdoor distribution with 400 V 3P+N		
Test description	The test must be in compliance with the following documents: 01251-100-S07-E99-0008 Lighting and Small Power System Layout 01251-100-S07-K09-0004 Ancillaries supplier data sheet 01251-100-S07-E10-0002 Indoor Panel Single Line diagram 01251-100-S07-E10-0003 Outdoor Panel Single Line Diagram 01251-100-S07-D99-0011 EPM Cable routing & Lighting Layout		
Acceptance Criteria	Single Test of the small power system circuit as defined in the electrical documentation. Check the correct function of the small power system external and internal		
2.2.3	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>Conel</i>	<i>A. Abdelaziz</i>	<i>R. H. / 1/25</i>

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

Section 3: EPM LIGHTNING SYSTEM

DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship

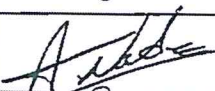


Lightning System



Visual test and continuity check of the earthing system will be performed as per the relevant documentation

Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test) the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

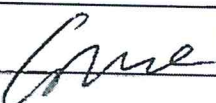
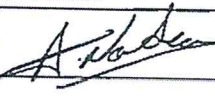
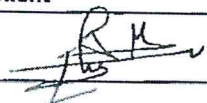
Name and Surname	Company/Position	Signature	Date
Ahmed Khader	ENPPI		5/7/2021
M. Ibrahim	PPC		5/7/2021
COTI COTILIN FABIO	CEAR		05-07-20
	CEAR		

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

3.1 Documentation.




Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0010	R.4	Lightning System General Layout
01251-100-S07-C99-0008	R.3	Lightning Protection Calculation

3.1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 3.1		
	Acceptance criteria	All the documentation listed on chapter 3.1 Section 3 of the SAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3.2 Lightning System



3.2.1	Lightning system layout installation			
	Aim	Verify the installation of the EPM lightning system		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the following document: 01251-100-S07-E99-0010 Lightning System Layout		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Lightning system continuity check			
Aim	Verify the continuity of the EPM lightning system		
Pre-requisites	N.A.		
Test description	The installation and the material must be in compliance with the following document: 01251-100-S07-E99-0010 Lightning System Layout		
Acceptance Criteria	The resistance measured shall be at least $< \Omega$.		
Instrument	Type: CHAUVIN ARMOUX Mod.: CA 650.5 S/N: SHU147858P6 Test Certificate : ... F050.17...		
3.2.2 Notes	$R = < 1 \Omega$		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21		A. Abdel	

	<u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u>	
---	--	---

Section 4: EPM MCT Multicable Transition System

DESCRIPTION OF THE TESTS

Visual test

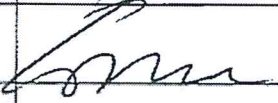
General visual test will be performed to verify the good workmanship

Identification and Marking Check

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT ((Commissioning and Site Integration Test) the present people must sign next to their name.


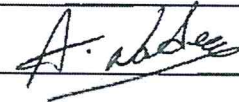
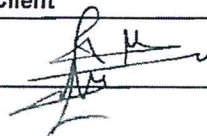
CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Almed Madem	ENPPI		5/7/2021
H. Ibrahim	PPC		5/7/2021
COTI COTIN FABIO	CEAR		05-07-21
	CEAR		




4.1 Documentation.



Following a list of the relevant documents used to perform the sAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E99-0005	R.4	MCT Frame Layout and schedule

4.1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 4.1.		
	Acceptance criteria	All the documentation listed on chapter 4.1 Section 4 of the SAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date		Supplier	Customer	Client
05-07-20				

4.2 MCT FRAME

4.2	MCT Frame layout installation			
	Aim	Verify that the installation of the MCT layout		
	Pre-requisites	N.A.		
	Test description	The installation and the material must be in compliance with the following document: 01251-100-S07-E99-0005 MCT Frame Layout Arrangement		
	Acceptance Criteria	Visual check and quantity check of the equipment		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
05-07-21				

	<u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u>	
---	--	---

CRUDE OIL TANK FARM 1251-100



EPM MODULE 030-EPM4

DP-1 Indoor Distribution Panel

SAT

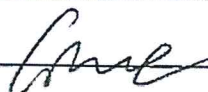
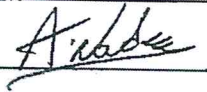

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-16-7				
			Enppi Ref.: 01251-100-S07-P06-0007 R.1				
					Language: E		Total Pages: 11
This document is the property of Enppi. It must not be stored reproduced or disclosed to others without written authorization from the COMPANY							

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1	DP-1 operating conditions.			
	Aim	Check the functioning of the DP-1		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution		
	Acceptance criteria	The electrical functioning of the DP-1 must be in compliance with the following document: 01251-100-S07-E10-0002 Indoor Panel Single & Wiring Diagram		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-71				

5 COMMISSIONING AND START-UP PROCEDURES DP 1 INDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Indoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:

The indoor provide supply the internal EPM circuit and 230V 50 Hz internal and external socket.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the distribution Panel is ready for electrical test without voltage supply
Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

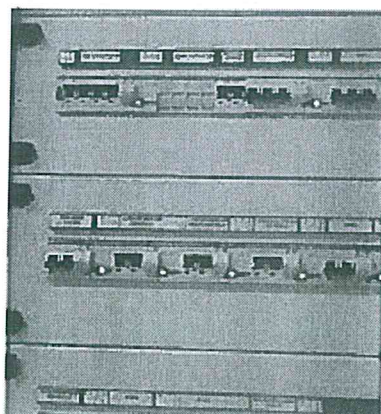
The indoor panel DP 1 is provided with the following measuring control (see picture):



- Main circuit breaker
- Ammeter and relevant ammeter switch
- Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly


Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0002-Indoor Panel Single Line and Wiring Diagram)

The operation is the following:

Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF1.1 and supply the aux. transformer for signal lamp.
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Close the main breaker QF1 to supply all circuit breaker Closed the breaker QF0 for pilot circuit emergency light
Close the Circuit Breaker QF2 to QF12 step by step to supply circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

**CRUDE OIL TANK FARM
1251-100**


EPM MODULE 030-EPM4

DP-2 Outdoor Distribution Panel

SAT



**Commissioning and Site Integration Test
Procedures**

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0008 R.1				
			Language: E		Total Pages: 13		
<p><small>This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANY</small></p>							

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	 <small>CONSTRUCTION ELECTRICITY AND WATER</small>
---	---	--

INDEX

INTRODUCTION SAT PROCEDURE.....	3
Aim of the document.....	3
1.1 Personnel involved in the SAT.....	3
1.2 DOCUMENTATION.....	4
2. TESTING STRATEGY.....	4
3. INSTALLATION TESTING.....	5
3.1 Documentation check.....	5
3.2 General construction Check.....	6
3.3 Power supply Check.....	9
4. FUNCTIONAL TESTING.....	10
4.1 Electrical equipment.....	10
5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL.....	11
5.1 Preliminary operation.....	11
5.1.1. Mechanical assembling	11
5.1.2 Electrical / Instrument connecting	11
5.1.3 Check and Test with Voltage supply	11
5.1.4 Test the circuit one by one and not at the same time in order to check	12
correctly	12

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the Outdoor DP-2 Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied DP-2 Panel

Definition:

Supplier: CEAR

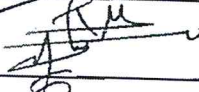
Customer: ENPPI

Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Almeda Adhem	ENPPI		5/7/2021
M. Ibrahim	PPC		5/7/2021
Com. Com. in. F. A. B. I. O.	CEAR		05-07-21
	CEAR		

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001		General Arrangement
01251-100-S07-E02-0003		Outdoor Light Distribution Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0003		Outdoor Panel Single & Wiring diagram.
01251-100-S07-K11-0008		EPM Filled in DP-2 Outdoor Distribution Panel Data Sheet
01251-100-S07-E05-0002		EPM Internal Cable schedule

2. TESTING STRATEGY



The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

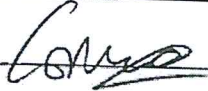
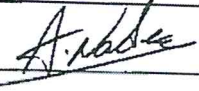
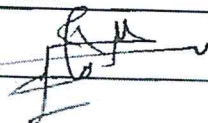
The Functioning testing phase is developed to test the functioning of the:

- Electrical equipment

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3. INSTALLATION TESTING.

3.1 Documentation check.

<p align="center">3.1</p> <p align="center">Notes</p>	<p align="center">Documentation check.</p>			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.		
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



3.2 General construction Check

Terminal block connections.			
Aim	Check the terminal block connections (wiring and tightening).		
Pre-requisites	N.A.		
Test description	Visual inspection and tightening test (with a screw driver).		
Acceptance criteria	The terminal block connections must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout		
Instrument	Screw driver.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

Earthing connections.			
Aim	Check the earthing connections (wiring and tightening).		
Pre-requisites	N.A.		
Test description	Visual inspection and tightening test (with a screw driver or a wrench).		
Acceptance criteria	The earthing connections must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E99-0009 Earthing System Internal External Layout		
Instrument	Screw driver, Wrench.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Electrical equipment labels.			
Aim	Check the equipment labels.		
Pre-requisites	N.A.		
Test description	Visual inspection.		
Acceptance criteria	The electrical equipment labels must be in compliance with the following document: 01251-100-S07-E02-0002 Indoor Overall Dimension Panel Layout		
Instrument	N.A.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>Cono</i>	<i>A. Abdel</i>	<i>[Signature]</i>



DP-2 Cleanliness of the equipment			
Aim	Check the cleanliness of the equipment.		
Pre-requisites	N.A.		
Test description	Visual inspection.		
Acceptance criteria			
Instrument	N.A.		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>Cono</i>	<i>A. Abdel</i>	<i>[Signature]</i>



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**




3.2.5	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc.			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The DP-2 arrangement must be in compliance with the following documents: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram 01251-100-S07-E02-0003 Outdoor DP-2 Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

3.3 Power supply Check

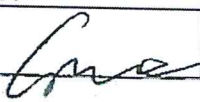
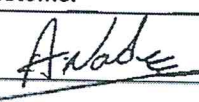
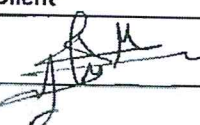
3.3.1	Main circuits Power supply				
	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: <u>HT 1104A</u> Mod.: <u>HT 1100</u> S/N: <u>88600.509</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>400V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>Com</u>	<u>A. Abdel</u>	<u>[Signature]</u>		

3.3.2	Auxiliary circuits Power supply				
	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>HT 1104A</u> Mod.: <u>HT 1100</u> S/N: <u>88600.509</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>230V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>Com</u>	<u>A. Abdel</u>	<u>[Signature]</u>		

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	DP-2 operating conditions.			
	Aim	Check the functioning of the DP-2		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution. Check the operation of photocell and relevant contactor.		
	Acceptance criteria	The electrical functioning of the DP-2 must be in compliance with the following document: 01251-100-S07-E10-0003 Outdoor Panel Single & Wiring Diagram		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

5 COMMISSIONING AND START-UP PROCEDURES DP 2 OUTDOOR PANEL

5.1 Preliminary operation

Before starting-up the electrical and instrumentation commissioning of Outdoor Power Distribution Panel all the lighting circuit will be terminated and all the followings point should be checked and confirmed:

The outdoor panel provide supply the perimetral and roof top EPM lighting circuits and all area external lighting system installed by Enppi.
Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the distribution Panel is ready for electrical test without voltage supply

Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the Indoor Power Distribution Panel is ready for electrical and instrument test with power supply.

5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

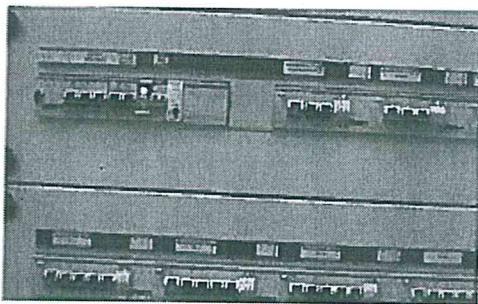
The indoor panel DP 2 is provided with the following measuring control (see picture):



- Main circuit breaker
- Ammeter and relevant ammeter switch
- Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



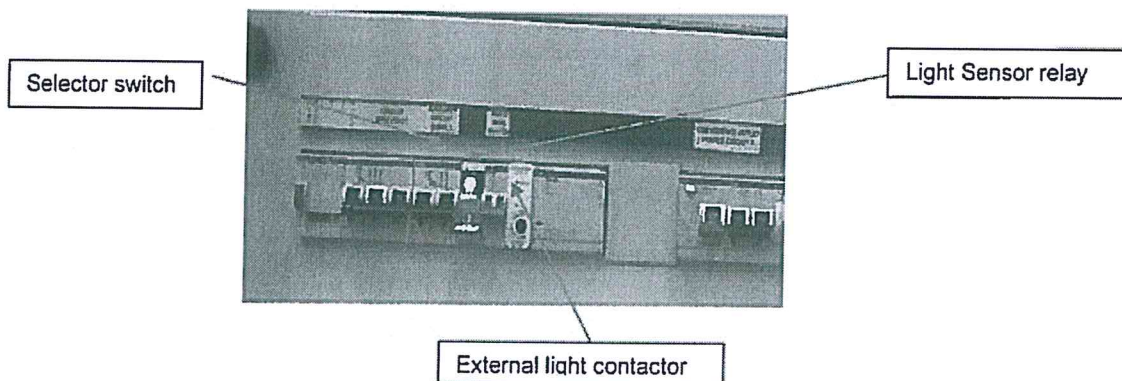
The outdoor panel is provided with the section for outdoor lighting system controlled by light sensor installed under the roof top.

This section is equipped with:

- Selector switch 3 position "Man.-0-Auto"
- Light sensor relay

In "Auto" position the lighting system is controlled by an external sensor that provide to command the contactor for external lighting system based on the daylight.

In "Manual" position the lighting system is always on, the sensor is not operated



The next description includes the action for each section step by step.

For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)



The operation is the following:



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1
Check by the Lamp Test SB1 the correct function of the signal lamp Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.
Close the Main Circuit breaker QF1
By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker
Closed the breaker QF 0 for pilot circuit emergency light
Close the Circuit Breaker QF 3 QF 4 QF 5 step by step to supply all circuit convenience outlet sockets and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault
Close the Circuit Breaker QF6 to QF13 step by step to supply all circuit and check the output voltage by voltmeter. For Each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	 <small>CONTRATTORE ELETTRONICHE CLAR S.p.A.</small>
---	---	--

**CRUDE OIL TANK FARM
1251-100**

EPM MODULE 030-EPM4



BUS DUCT

**SAT
Commissioning and Site Integration Test
Procedures**

1	17/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-510-16				
			Enppi Ref.: 01251-100-S07-P06-0004 R.1				
			Language: E		Total Pages:9		
<small>This document is the property of Enppi It must not be stored reproduced or disclosed to others without written authorization from the COMPANY</small>							

INDEX

Aim of the document.....	3
Personnel involved in the SAT.....	3
DESCRIPTION OF THE TESTS.....	4
1 Documentation.....	4
2. Visual Check	6
3. Electrical Safety Check	7

	<u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u>	
---	--	---

INTRODUCTION BUS DUCT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

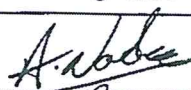

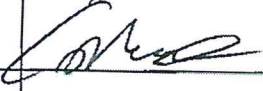
Customer: ENPPI


Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Abdelmonem	ENPPI		5/7/2021
M. Ibrahim	PPC		5/7/2021
COR-1, COM-1 FABIS	CEAR		05-07-21
	CEAR		

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.

Identification and Marking Check will

Safety check insulation and dielectric test

1 Documentation.

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).



Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0006	R.2	EPM Bus Duct Data Sheet Supplier
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement




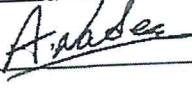

**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Documentation check				
1.1.1	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				


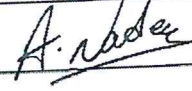
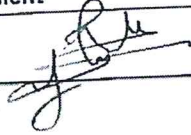
	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

2. Visual Check

2.1	Visual Check			
	Aim	Visual check of the good construction of the Bus Duct		
	Pre-requisites	N.A.		
	Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.		
	Acceptance criteria	Visual test and relevant photo		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3. Electrical Safety Check

Electrical Safety Check Insulation resistance measuring			
Aim	Measure the insulation resistance between each phase and neutral against earth (with the remaining phases and neutral connected to the earth).		
Pre-requisites	N.A.		
Test description	The insulation resistance tests shall be carried out with all manually operated and latched type switching devices in the closed position and main fuses installed.		
Acceptance criteria	The insulation resistance measured shall be at least 10 MΩ.		
Instrument	Type: CHAUOVIW... A.D.No. 0.1... Mod.: GA-6505... S/N: 147.858.P6H Test Certificate: SDV.147.858.P627		
3.1.1	Test results	Value checked L1-E. 3,38 6Ω L2-E. 3,26 6Ω L3-E. 3,80 6Ω N-E. 6,12 06 Ω	
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

Electrical Safety Check Dielectric test for bus bars			
Aim	Perform a dielectric test of the main circuits (400V ac) in accordance with CEI EN 61439-1 standard.		
Pre-requisites	N.A.		
Test description	Withstand voltage should be 2500 V ac for 1 minute. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
Instrument	Type: <u>HOIMA</u> Mod.: <u>MF2270</u> S/N: <u>51100.5</u> Test Certificate: <u>3004-0.1</u>		
3.1.2	Test results	$L1-G = 3.5 \text{ M}$ $L2-G = 1.5 \text{ M}$ $L3-G = 1.5 \text{ M}$ $N-G = 4.2 \text{ M}$	
	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<u>Comer</u>	<u>Andee</u>	<u>R. H.</u>

Enppi**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

Earthing Bus Duct continuity check			
Aim	Verify the installation of the earthing system of the Bus Duct		
Pre-requisites	N.A.		
Test description	The installation and the material must be in compliance with the values reported on the following documents: 01251-100-S07-E99-0009 Earthing System Layout 01251-100-S07-K009-0006 EPM Bus Duct Data Sheet Supplier 01251-100-S07-K011-0006 EPM Filled in Purchaser Bus Duct Data Sheet		
Acceptance Criteria	The resistance measured shall be at least $< \Omega$.		
Instrument	Type: CHAUVIN ARNOUX Mod.: CA 6505 S/N SHV 247850 P04 Test Certificate : F.85017		
3.1.3	Value checked: 42 Ω		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

**CRUDE OIL TANK FARM
1251-100**

**EPM MODULE 030-EPM4
DRY TYPE TRANSFORMER**

SAT

**Commissioning and Site Integration Test
Procedures**

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
Notes:			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-500-16				
			Enppi Ref.: 01251-100-S07-P06-0003 R.1				
			Language: E			Total Pages:9	
<p align="center">This document is the property of Enppi. It must not be stored reproduced or disclosed to others without written authorization from the COMPANY</p>							





**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
Personnel involved in the SAT.....	3
DESCRIPTION OF THE TESTS.....	4
1. Documentation.....	4
2. Visual Check (without voltage supply).....	6
3. H.V. Cable Connection box.....	7
4. Earthing Connection Check (without voltage supply).....	8
5. H.V. Transformer energization 6,6 kV from Enppi substation (Power ON).....	9

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR

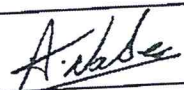

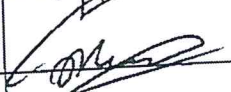
Customer: ENPPI

Client: PPC

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test); the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Ahmed Kader	ENPPI		5/7/2021
M. Dardir	PPC		5/7/2021
Cott, Corium FAB12	CEAR		05-03-21
	CEAR		

DESCRIPTION OF THE TESTS

Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages on the welds.

Dimensional Check will be performed to check if the dimensions of the component are in tolerances as per manufacturing drawings.

Surface Painting check will be performed to check the painting coating and final internal/external color.



Identification and Marking Check

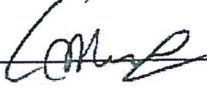
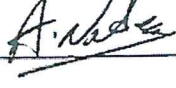

Routine test certificate check

1. Documentation

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

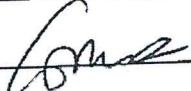
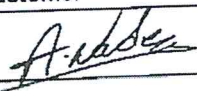
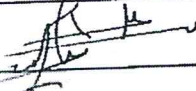
Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	EPM General Arrangements
01251-100-S07-E99-0007	R.4	Dry Type Transformer General Arrangement
01251-100-S07-K09-0005	R.3	EPM Transformer Data Sheet Supplier
01251-100-S07-K11-0005	R.4	EPM Filled in Purchaser Transformer Data Sheet
01251-100-S07-K11-0006	R.5	EPM Filled in Purchaser Bus Duct Data Sheet
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K12-0001	R.1	EPM Noise Data Sheet
01251-100-S07-E99-0009	R.4	Earthing system layout
01251-100-S07-E10-0001	R.5	LVSWG Single Line Diagram

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

1.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 Section 1 of the FAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
03-07-11				

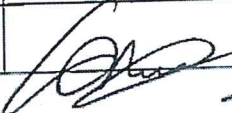
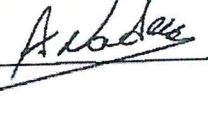
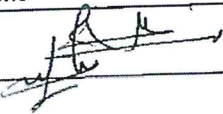
	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

2. Visual Check (without voltage supply)

Visual Check						
Aim	Visual check of the good construction of the transformer and the transformer box					
Pre-requisites	N.A.					
Test description	Visual test will be performed to verify the good workmanship, the absence of sharpen edge, the absence of damages.					
Acceptance criteria	Visual test and relevant photo					
2.2.1	<p align="center">Notes</p>					
Executed				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date				Supplier	Customer	Client
05-07-21						

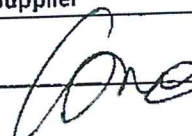
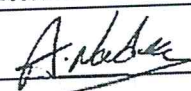
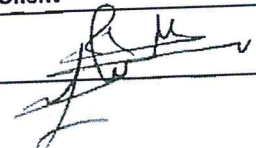
	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3. H.V. Cable Connection box

3.1	HV Cable Connection box			
	Aim	Verify the connection between transformer and HV box		
	Pre-requisites	N.A.		
	Test description	Visual connection marking check and tightening bolt control		
	Acceptance criteria	The dimensions must be in compliance with the values reported on the following documents: 01251-100-S07-E99-000 7 Dry Type transformer General Arrangements		
	Marking phase check			
	Notes	<p>IMPORTANT NOTE</p> <p>All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department.</p> <p>Before supply the transformer with 6,6 kV all test must be done and certified with a test report.</p>		
	Executed	<input type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

Enppi	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
--------------	---	---

4. Earthing Connection Check (without voltage supply)

Earthing Connection continuity check			
Aim	Verify the installation of the earthing connection		
Pre-requisites	N.A.		
Test description	The installation and the material must be in compliance with the values reported on the following documents: 01251-100-S07-E99-0009 Earthing System Layout 01251-100-S07-K009-0005 EPM Transformer Data Sheet Supplier		
Acceptance Criteria	The resistance measured shall be at least $< \Omega$.		
Instrument	Type: CHAUVIN ARNOUX Mod.: CA6505 S/N: SDV.447858P621 Test Certificate: F85012		
4.1	Notes	Resistance value: $< 1 \Omega$	
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



5. H.V. Transformer energization 6,6 kV from Enppi substation (power on)
The activity is in charge of Enppi commissioning department

Power on transformer 6,6 kV			
Aim	Energize the EPM transformer from the substation Enppi		
Pre-requisites	All operations and safety rules must be in charge of Enppi		
Test description	Energizing operation from the substation		
Acceptance Criteria	Verify the voltage value in accordance with the 01251-100-S07-K009-0005 EPM Transformer t Data Sheet Supplier		
Instrument	Verify and check the voltage value in the substation room		
5.1	Notes	<p>IMPORTANT NOTE All operations concerning the H.V and MCT cable installation, cable connection ,6,6 kV power supply control, cable insulation and relevant tests are in charge of Enppi electrical commissioning department. Before supply the transformer with 6,6 kV all test must be done and certified with a test report. Report test check Power supplykV L1-L2:kV L2-L3:kV L3-L1:kV Insulation resistance test H.V cable Resistance value: Ω Dielectric test H.V. cable</p> <p><i>* Tr. Power-up shall be performed upon availability of 6.6 kV supply</i> <i>Not Available</i></p>	
Executed	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

CRUDE OIL TANK FARM 1251-100

EPM MODULE 030-EPM4

UPDP Distribution Panel

SAT

Commissioning and Site Integration Test Procedures

1	16/11/2020	Approval	BP	LS	GA		
0	30/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-510-16				
			Enppi Ref.: 01251-100-S07-P06-0009 R.1				
			Language: E			Total Pages: 12	
This document is the property of Enppi. It must not be stored, reproduced or disclosed to others without written authorization from the COMPANY.							





**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
1.1 Personnel involved in the SAT.....	3
1.2 DOCUMENTATION.....	4
2. TESTING STRATEGY.....	4
3.1 Documentation check.....	5
3.2 INSTALLATION CHECK.....	6
3.3 POWER SUPPLY CHECK.....	8
4. FUNCTIONAL TESTING.....	9
4.1 Electrical equipment.....	9
5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL	10
5.1 Preliminary operation.....	10
5.1.1. Mechanical assembling.....	10
5.1.2 Electrical / Instrument connecting.....	10
Field test check.....	10
Check and Test without voltage supply.....	10
5.1.3 Check and Test with Voltage supply.....	11
5.1.4 Test the circuit one by one and not at the same time in order to check correctly.....	11

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the FAT, Functional & Performance Test for the UPS Distribution Panel of the EPM electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied UPS Panel

Definition:

Supplier: CEAR

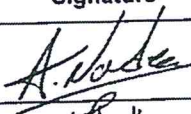

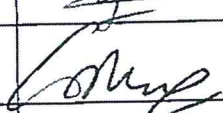
Customer: ENPPI


Client: PPC

1.1 Personnel involved in the SAT

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR and ENPPI can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
Almed Abdelmonem	ENPPI		5/8/2021
M. Ibrahim	PPC		5/7/2021
Cory Cotton TABLE	CEAR		05-07-21
	CEAR		

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

1.2 DOCUMENTATION

Following a list of the relevant documents used to perform the FAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0004	R.4	UPS Panel Overall Dimensions Panel Layout
01251-100-S07-E10-0004	R.4	UPS Panel Single & Wiring diagram.
01251-100-S07-K11-0009	R.2	EPM Filled UPS Distribution Panel Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule

2. TESTING STRATEGY

The testing strategy includes the following two phases.

The **Installation** testing phase is developed to test the:

- Documentation;
- Mechanical installation ;
- Electrical installation.

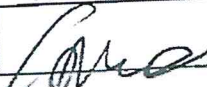
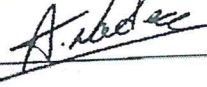

The **Functioning** testing phase is developed to test the functioning of the:



- Electrical equipment

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

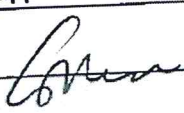
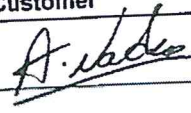
3. INSTALLATION TESTING.

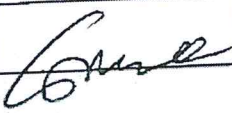
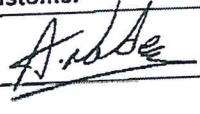

3.1 Documentation check.


3.1	Documentation check.				
	Aim	Check the presence of the project documentation.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the state of the documentation listed on chapter 1.2 of the FAT procedure.			
	Acceptance criteria	All the documentation listed on chapter 1.2 of the FAT procedure have to be present.			
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result <input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative		
	Date	Supplier	Customer	Client	
05-07-21					

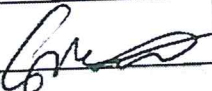
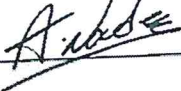
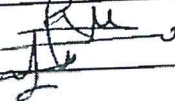
	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3.2 INSTALLATION CHECK

3.2.1	Earthing connections.			
	Aim	Check the earthing connections (wiring and tightening).		
	Pre-requisites	N.A.		
	Test description	Visual inspection and tightening test (with a screw driver or a wrench).		
	Acceptance criteria	The earthing connections must be in compliance with the following documents: 01251-100-S07-E10-0004 UPS Single & Wiring Diagram 01251-100-S07-E99-0009 Earthing System Internal External Layout		
	Instrument	Screw driver, Wrench.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
		05-07-21		

3.2.2	UPS Cleanliness of the equipment			
	Aim	Check the cleanliness of the equipment.		
	Pre-requisites	N.A.		
	Test description	Visual inspection.		
	Acceptance criteria			
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
	Date	Supplier	Customer	Client
		05-07-21		 

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3.2.3	Mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..			
	Aim	Check the functioning of the mechanical and electrical interlocks, door and isolating handle interlocks, key interlocks, etc..		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	All the mechanical and electrical interlocks described on the following documents must be operative: The UPS arrangement must be in compliance with the following documents: 01251-100-S07-E10-0004 UPS Single & Wiring Diagram 01251-100-S07-E02-0004 UPS Overall Dimension Panel Layout		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

3.3 POWER SUPPLY CHECK

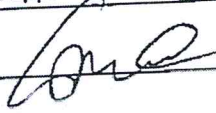

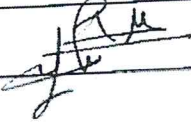
3.3.1	Main circuits Power supply				
	Aim	Check the main circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the main power supply voltage.			
	Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
	Instrument	Type: <u>HIT 170419</u> Mod.: <u>HT 3200</u> S/N: <u>88600508</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>400 V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>		

3.3.2	Auxiliary circuits Power supply				
	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>H.T. 170419</u> Mod.: <u>HT 3200</u> S/N: <u>88600508</u> Test Certificate: <u>7544</u>			
	Measured voltage	Value	<u>230V</u>	Frequency	<u>50 Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>		

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

4. FUNCTIONAL TESTING.

4.1 Electrical equipment.

4.1.	UPS operating conditions.			
	Aim	Check the functioning of the UPS		
	Pre-requisites	N.A.		
	Test description	Check the circuit breaker, signal lamps and verify the output distribution		
	Acceptance criteria	The electrical functioning of the UPS must be in compliance with the following document: 01251-100-S07-E10-0004 UPS Single & Wiring Diagram		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
03-07-21				

5 COMMISSIONING AND START-UP PROCEDURES UPS PANEL

5.1 Preliminary operation

The UPS panel provide to fed the auxiliary and command circuit of the LVSWG MCC panel the power supply of the F&G panel, the supply for external shut down valve and the Tank Radar Gauging.
The UPS is powered from the Enppi UPS Substation so as to guarantee continuity of power supply even in the event of a power loss.

Before starting-up the electrical and instrumentation commissioning of UPS Panel all connection with the other panel will be terminated and all the followings point should be checked and confirmed:

The circuit breakers of the others panel connected to the UPS panel must be in open position.

Each circuit is controlled by the relevant circuit breaker.

5.1.1. Mechanical assembling

	Check equipment's alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

5.1.2 Electrical / Instrument connecting

	Check cabling connection	<input checked="" type="checkbox"/>
	Check insulated test of cabling system before energizing on the outgoing	<input checked="" type="checkbox"/>

After confirmation, the UPS Panel is ready for electrical test without voltage supply

Field test check

Check and Test without voltage supply

Before energising the system, all the followings point should be checked and confirmed:

	Check earthing system connection from the external grounding system to the Indoor Power Distribution Panel ground bar (PE bar).	<input checked="" type="checkbox"/>
	Check and/or set all electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

After confirmation, the UPS Panel is ready for electrical and instrument test with power supply.

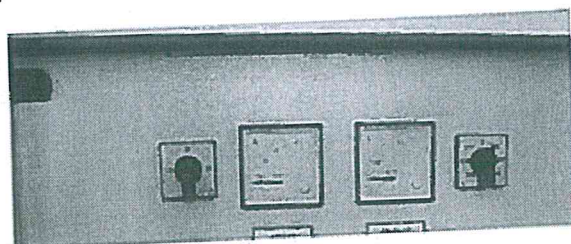
5.1.3 Check and Test with Voltage supply

Before energizing the indoor panel, all breaker must be open.

Require to Enppi supervisor to close the power circuit breaker in the UPS Substation and verify the voltage value.

The verification and the connection of the power supply cable is in charge to Enppi

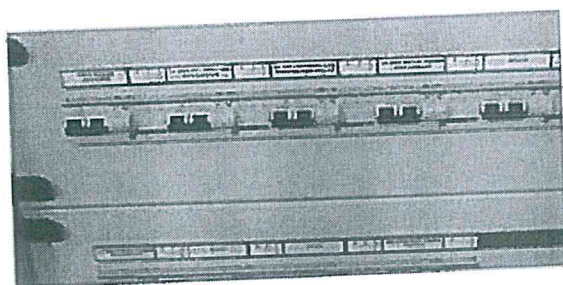
The UPS panel is provided with the following measuring control (see picture):



- Main circuit breaker
- Ammeter and relevant ammeter switch
- Voltmeter and relevant voltmeter switch

5.1.4 Test the circuit one by one and not at the same time in order to check correctly

Each lighting circuit is controlled by the relevant switch breaker, each breaker is equipped with 3 signal lamps green "OFF", red "ON", yellow "FAULT".



The next description includes the action for each section step by step.
For the function of each circuit breaker (Refer to the 01251-100-S07-E10-0003 Outdoor Panel Single Line and Wiring Diagram)

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

The operation is the following:

<p>Check the voltage supply on the 3 P+N on the Voltmeter PV1 by the voltmeter switch SV 1 close the fuse switch QU1.1</p>
<p>Check by the Lamp Test SB1 the correct function of the signal lamp</p>
<p>Close the breaker QF 1.1 and supply the aux. transformer for signal lamp.</p>
<p>Close the Main Circuit breaker QF1</p>
<p>By the signal lamp HL1.1/2.1/3.1 check the status of main circuit breaker</p>
<p>Close the Circuit Breaker QF 2 to QF 12 step by step to supply all circuit and check the output voltage by voltmeter.</p>
<p>For each circuit breaker are provided the following signal lamp: -Red Lamp Circuit breaker close -Green Lamp Circuit breaker open -Yellow Lamp Fault</p>

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

**CRUDE OIL TANK FARM
1251-100**

EPM MODULE 030-EPM4

LVSWG MCC

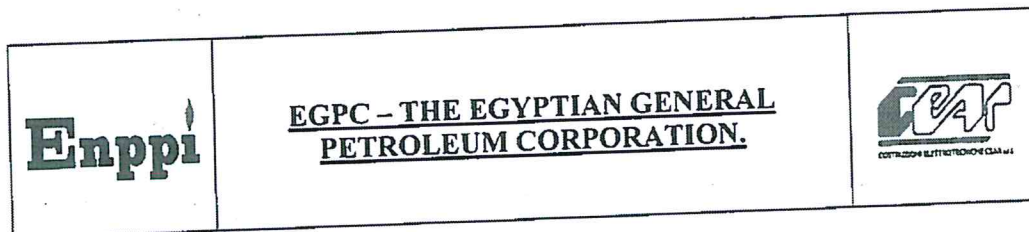
SAT

**Commissioning and Site Integration Test
Procedures**

1	16/11/2020	Approval	BP	LS	GA		
0	20/10/2020	Approval	BP	LS	GA		
Rev.	Date	Issued For	Prepared	Checked	Approved	Approved	Approved
<u>Notes:</u>			EGPC – THE EGYPTIAN GENERAL PETROLEUM CO.				
			Contract Number: 1251-100-16-7				
			Enppi Ref.: 01251-100-S07-P06-0002 R.1				
			Language: E			Total Pages: 30	
<p style="font-size: small;">This document is the property of Enppi It must not be stored, reproduced or disclosed to others without written authorization from the COMPANY</p>							

INDEX

INTRODUCTION SAT PROCEDURE	3
Aim of the document.....	3
TESTING STRATEGY.....	3
Safety precaution.....	3
Personnel involved in the SAT.....	4
DESCRIPTION OF THE TESTS.....	4
1.1. Testing Equipment to be used.....	5
1.2. Documentation.....	6
1.2.1. Documentation check	7
2. GENERAL CONSTRUCTION CHECK	8
3. EQUIPMENT CHECK	11
4. ELECTRICAL SAFETY CHECK.....	12
5. POWER SUPPLY CHECK.....	15
6. FUNCTIONAL TESTING.....	18
6.1. Electrical equipment.....	18
7. COMMISSIONING and START-UP PROCEDURES	23
7.1. Preliminary operations.....	23
7.1.1 Mechanical assembling check list.	23
7.1.2 Electrical connection check list.	23
7.1.3 Checks without power supply.....	23
7.2. COMMISSIONING	24
7.3. INCOMING LINE SWITCH FUNCTION (column 1).....	25
7.3.1. NORMAL OPERATION.....	25
7.3.2. POWER SUPPLY LOSS.....	26
7.3.3. POWER RESTORATION	26
7.4. LVSWG MCC Columns	27
7.4.1. Drawer feeder commissioning/operating (column 2)	27
7.4.2. DOL drawer commissioning/operating (column 3 and 4)	28



INTRODUCTION SAT PROCEDURE

Aim of the document.

This document is the SAT Commissioning and Site Integration Test Procedure for the EPM Electrical Power Module

The document is the acceptance protocol concerning the characteristics of the supplied EPM

Definition:

Supplier: CEAR
Customer: ENPPI
Client: PPC

TESTING STRATEGY

The testing strategy includes the following two phases.

The Installation testing phase is developed to test the:

- Documentation;
- Mechanical installation;
- Electrical installation.

The Functioning testing phase is developed to test the functioning of the:

- Mechanical equipment's
- Electrical equipment's

Safety precaution

Before the beginning of the test brief safety induction will be done to all the people attending the test.

We will describe the company safety rules and the rules to be followed while attending the test.

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

Personnel involved in the SAT.

The table below shows the people who participate at the activity of the SAT (Commissioning and Site Integration Test Procedures): the present people must sign next to their name.

CEAR can use an external Inspector / Agency or third-party Body.

Name and Surname	Company/Position	Signature	Date
<i>Ahmed Eladani</i>	ENPPI	<i>[Signature]</i>	5/7/2021
<i>M. Ibrahim</i>	PPC	<i>[Signature]</i>	5/7/2021
<i>Com. Com. W. / FABIO</i>	CEAR	<i>[Signature]</i>	05-07-21
	CEAR		



DESCRIPTION OF THE TESTS

Visual test

General visual test will be performed to verify the good workmanship and correct installations

This document is the Site Acceptance Test for the Motor Control Center.

The document is the acceptance protocol concerning the hardware characteristics of the supplied MCC.

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

1.1. Testing Equipment to be used

Following a list of the instruments shall be available during the SAT by ENPPI:

Instrument	Model	Serial Number	Calibration expiry date
Electrical safety Tester for insulation and Dielectric tests	MTBTN56 MIL270	SM005	06-10-23
High voltage insulation Tester up to 1 kV DC (megger)	CHAUVIN ANNUY	SAV 1/285864	25-11-21
Torque wrench	US56	A3032010/675	06-08-22
Multimeter	HT 9200 HT IT304A	9360 Jga	01-02-21
Ammeter Clamp	HT 9029 HT IT304A	10073001	03-01-21

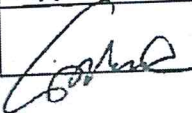
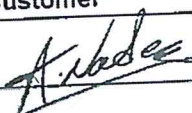
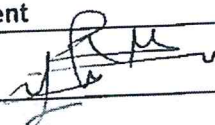
1.2. Documentation.

Following a list of the relevant documents used to perform the SAT (please fill the table with the last revision number of the documents used).

Document No.	Rev.	Description
01251-100-S07-B01-0001	R.7	General Arrangement
01251-100-S07-E02-0001	R.4	LVSWG Overall Dimensions Panel Layout
01251-100-S07-E10-0001	R.5	LVSWG Single line diagram.
01251-100-S07-E99-0006	R.4	LV Bus Duct General Arrangement
01251-100-S07-K09-0003	R.4	EPM Main Equipment Supplier Data Sheet
01251-100-S07-E05-0002	R.5	EPM Internal Cable schedule


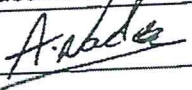

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

1.2.1. Documentation check

1.2.1	Documentation check			
	Aim	Check the presence of the project documentation.		
	Pre-requisites	N.A.		
	Test description	Check the presence and the state of the documentation listed on chapter 4.1 of the SAT procedure.		
	Acceptance criteria	All the documentation listed on chapter 1.1 of the SAT procedure have to be present.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

2. GENERAL CONSTRUCTION CHECK

2.1.1	Terminal block connections.			
	Aim	Check the terminal block connections (wiring and tightening).		
	Pre-requisites	N.A.		
	Test description	Spot visual inspection and tightening test (with a screw driver).		
	Acceptance criteria	The terminal block connections must be in compliance with the following documents: 01251-100-S07-E10-0001 LVSWG Single Line Diagram		
	Instrument	Screw driver.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

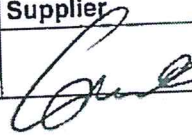
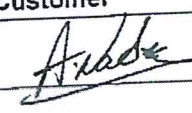
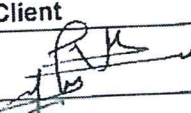



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**






LVSWG Cleanliness of the equipment			
Aim	Check the cleanliness of the equipment.		
Pre-requisites	Switchgear ready to be energized.		
Test description	Visual inspection.		
Acceptance criteria	The LV PMCC Switchgear is clean, dust has been removed and no tools are present in it.		
Instrument	N.A.		
2.1.2	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

2.1.3	Mechanical and electrical interlocks			
	Aim	Check the functioning of the mechanical and electrical interlocks, door handle interlocks, key interlocks)		
	Pre-requisites	N.A.		
	Test description	Functional test of all the mechanical and electrical interlocks.		
	Acceptance criteria	<p>All the mechanical and electrical interlocks described on the following documents must be operative: The LVSWG arrangement must be in compliance with the following documents: 01251-100-S07-E02-0001 LVSWG Overall Dimension Panel Layout. 01251-100-S07-E10-0001 LVSWG Single line Diagram</p>		
	Instrument	Operating handles, keys.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				

	EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.	
---	---	---

3. EQUIPMENT CHECK

3.1	Visual check of power and auxiliary equipment like circuit breakers, switches, relays, contactors, lamps (model / rating).			
	Aim	Check the correct selection, installation and wiring of the circuit breakers and switches.		
	Pre-requisites	N.A.		
	Test description	Visual inspection of electrical components.		
	Acceptance criteria	The LVSWG circuit breakers and switches must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
	Instrument	N.A.		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-21				



EGPC - THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.



4. ELECTRICAL SAFETY CHECK

Insulation resistance test main circuits	
Aim	A measurement of the resistance of the main circuit shall be made in accordance to IEC 61439-1 Standard.
Pre-requisites	N.A.
Test description	The measurement shall be made with DC voltage MegaOhmmeter by measuring the resistance across the terminals of each phase.
Acceptance criteria	Resistance value bigger than 10 Mohm. The measured value of the resistance shall be listed in the test report, as well as the general conditions during the test (current, air temperature, etc.) for future comparison.
Instrument	Type: CHAOVIL... ANNEX Mod.: CA 6505... S/N: 560247858P612 Test Certificate: F85012
Test results	L1-B = 5,656 Ω L2-B = 3,866 Ω L3-B = 4,866 Ω W-B = 22,036 Ω
Notes	
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Date	05-07-21
Supplier	One
Customer	Arada
Client	gmu

Enppi**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

Dielectric test for main circuits.			
Aim	Perform a dielectric test of the main circuits in accordance to IEC 61439-1 Standard.		
Pre-requisites	N.A.		
Test description	Withstand voltage should be 2,5 kV ac for 5 seconds. The power-frequency voltage test shall be performed according to the IEC requirements. The test voltage shall be applied connecting each phase conductor of the main circuit in turn to the high-voltage terminal of the test supply. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
4.1.2 Instrument	Type: <u>MeTmL</u> <u>M</u> Mod.: <u>MJ117.0</u> S/N: <u>Shaa5</u> Test Certificate: <u>3006-01</u>		
Test results	<u>L1-0 = 0,3 MA</u> <u>L2-0 = 0,3 MA</u> <u>L3-0 = 0,3 MA</u> <u>N-0 = 0,3 MA</u>		
Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
<u>03-07-11</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>

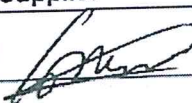
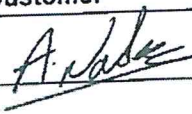
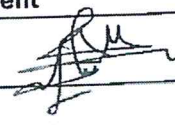
Enppi**EGPC - THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

Dielectric test for auxiliary circuits.			
Aim	Perform a dielectric test of the auxiliary circuits in accordance with CEI EN 61439-1 standard.		
Pre-requisites	N.A.		
Test description	Withstand voltage should be 1500 V ac for 5 seconds. Dielectric tests shall be done on 10% of the number of similar units with a minimum of 2 units.		
Acceptance criteria	Please refer to chapter 10.9.2.4 of the CEI EN 61439-1 Standard.		
Instrument	Type: <u>MOTNEL</u> Mod.: <u>M.F.2270</u> S/N: <u>SM005</u> Test Certificate: <u>2006-01</u>		
4.1.3	Test results	$P_{E00W} \text{ Aux SUPPLY} = L = 0,2 \text{ MA}$ $N = 0,2 \text{ MA}$ $DOL \text{ Aux SUPPLY} = L = 0,4 \text{ MA}$ $N = 0,4 \text{ MA}$ $NOP \ 615 \text{ Aux SUPPLY} = L = 0,2 \text{ MA}$ $N = 0,2 \text{ MA}$ $\text{Aux SUPPLY } 230V = L = 14,6 \text{ MA}$ $N = 23 \text{ MA}$ $\text{Aux SUPPLY } 110 \text{ VDC } t = 0,2 \text{ MA}$ $= 0,2 \text{ MA}$	
	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			

5. POWER SUPPLY CHECK


Main circuits Power supply				
Aim	Check the main circuits power supply.			
Pre-requisites	N.A.			
Test description	Check the presence and the value of the main power supply voltage.			
Acceptance criteria	The main circuits power supply voltage should be 400V 3P+N 50Hz.			
Instrument	Type: <u>HT-IT504</u> Mod.: <u>HT-8100</u> S/N: <u>00600599</u> Test Certificate: <u>7564</u>			
Measured voltage	Value	<u>400V</u>	Frequen cy	<u>50Hz</u>
5.1.1	Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Date	Supplier	Customer	Client	
<u>05-07-21</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

5.1.2	Auxiliary circuits Power supply				
	Aim	Check the auxiliary circuits power supply.			
	Pre-requisites	N.A.			
	Test description	Check the presence and the value of the auxiliary power supply voltage.			
	Acceptance criteria	The auxiliary circuits power supply voltage should be 230V 1P+N 50Hz.			
	Instrument	Type: <u>HT 12413</u> Mod.: <u>HT 1100</u> S/N: <u>98.600.509</u> Test Certificate: <u>7564</u>			
	Measured voltage	Value	<u>230V</u>	Frequen cy	<u>50Hz</u>
	Notes				
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
	Date	Supplier	Customer	Client	
<u>05-07-21</u>					


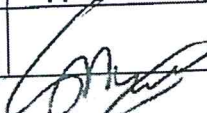
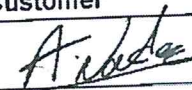
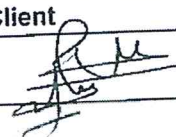
Enppi**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

Heaters and Internal light				
Aim	Check the heaters power supply.			
Pre-requisites	Low voltage auxiliary power supply 230 Vac control circuits interconnected.			
Test description	N.A.			
Acceptance criteria	The heaters power supply voltage should be 230V 1P+N 50Hz.			
Instrument	Type: <u>HT-1704A</u> Mod: <u>HT-1700</u> S/N: <u>88.600.503</u> Test Certificate: <u>7544</u>			
Measured voltage	Value	<u>230 V</u>	Frequen cy	<u>50/42</u>
5.1.3	Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Date	Supplier	Customer	Client	
<u>05-07-11</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	

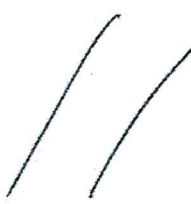
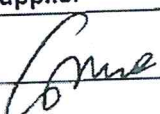
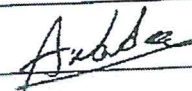
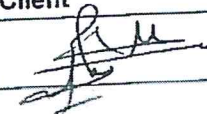
	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

6. FUNCTIONAL TESTING.

6.1. Electrical equipment.

6.1.1	LVSWG power sections operating conditions.			
	Aim	Operation tests shall be made to ensure that the switching devices and removable parts and mechanical interlocks work properly.		
	Pre-requisites	N.A.		
	Test description	These tests shall be performed without voltage on or current in the main circuits.		
	Acceptance criteria	It shall be verified that: – the switching devices open and close correctly – each removable part can be inserted and removed correctly; – all interlocks work properly.		
	Instrument	HT ITOLA HT0200		
	Notes			
	Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client	
05-07-11				

Enppi**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**

LVSWG withdrawable units operating conditions.			
Aim	Check the functioning of the LVSWG withdrawable motor starters		
Pre-requisites	N.A.		
Test description	Check the mechanical and electrical functioning of the withdrawable units: <ul style="list-style-type: none">• TEST mode;• REMOTE mode;		
Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
6.1.2	Checked units		
	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21			



**EGPC - THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



LVSWG withdrawable units operating conditions.			
Aim	Check the functioning of the LVSWG withdrawable feeders		
Pre-requisites	N.A.		
Test description	Check the mechanical and electrical functioning of the withdrawable units:		
Acceptance criteria	The mechanical and electrical functioning of the withdrawable units must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
6.1.3	Checked units		
	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	Comme	A. Abdel	EB



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



6.1.4	Protection relays functional test.			
	Aim	Check and test the protective relays by current injection on primary and secondary circuits.		
	Pre-requisites	N.A.		
	Test description	Inject the test current into the primary and secondary circuits of the Current Transformers and check the intervention of the relevant protection relays. Protection relays to be checked are the ones of the: <ul style="list-style-type: none">• LVSWG Incoming sections;• LVSWG withdrawable units.		
	Acceptance criteria	The protection relays intervention must be in compliance with the following document: 01251-100-S07-E10-0001 LVSWG Single line Diagram		
	Protection functions Tested	<i>As per FAT report</i>		
	Notes			
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative	
Date	Supplier	Customer	Client	
05-07-21	<i>Comer</i>	<i>A. Abdel</i>	<i>R. M.</i>	



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



Inter-changeability of electrically identical components.			
Aim	Check the inter-changeability of electrically identical components.		
Pre-requisites	N.A.		
Test description	Change the position/assembling of electrically identical components.		
Acceptance criteria	The system LVSWG must continue to work properly.		
6.1.5	Notes		
Executed	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Result	<input checked="" type="checkbox"/> Positive <input type="checkbox"/> Negative
Date	Supplier	Customer	Client
05-07-21	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

7. COMMISSIONING and START-UP PROCEDURES

7.1. Preliminary operations.

Before starting-up the electrical and instrumentation commissioning of the M.C.C. all the erection activity have to be completed and all the followings point should be checked and confirmed.

7.1.1 Mechanical assembling check list.

	Check equipment' alignment	<input checked="" type="checkbox"/>
	Check all bolts fixing	<input checked="" type="checkbox"/>

7.1.2 Electrical connection check list.

	Check cabling connection	<input checked="" type="checkbox"/>
	Check the insulation resistance of the outgoing cabling before energising the loads	<input checked="" type="checkbox"/>

7.1.3 Checks without power supply.

Before energising the system, all the followings point should be checked and confirmed.

	Check the grounding connection of the MCC	<input checked="" type="checkbox"/>
	Check and set all the electrical protection as per the wiring diagram	<input checked="" type="checkbox"/>

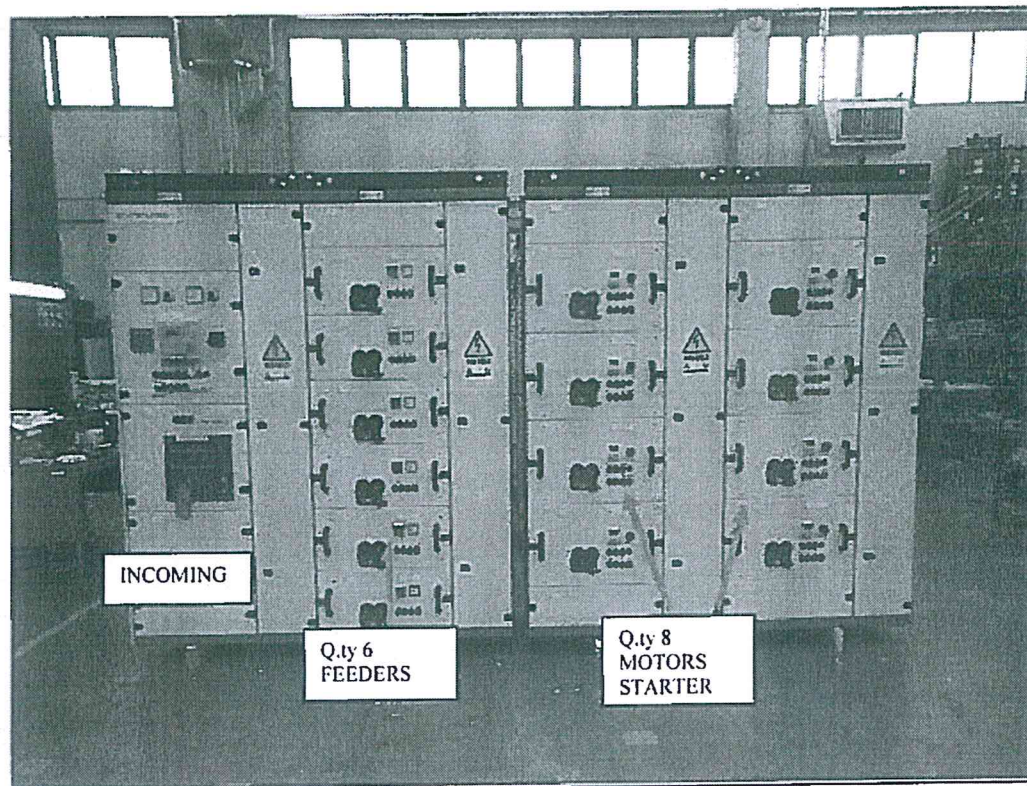
7.2.COMMISSIONING

Before starting the MCC energising sequence, all the Incoming Line Circuit breaker, the drawers main circuit breakers and the miniature circuit breakers must be previously opened.

MCC Power section commissioning/operating.

The MCC is supplied by one incoming line from transformer Tag 0XY-EPM(Z)-TR-1 400V 3ph +P + N (see fig. 1.1).

Fig. 1.1 – MCC Incoming Lines



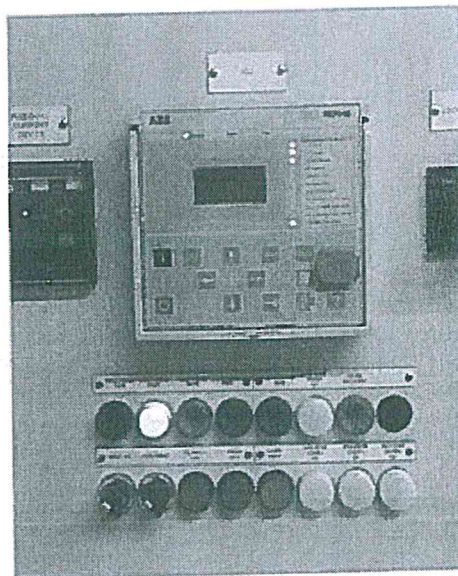
To start with the commissioning operation the LVSWG MMC shall be fed from the transformer 400 V 50 Hz 3P +N for power circuits and fed from the UPD panel for the auxiliary circuits 230V 50 Hz 1P+N.

7.3. INCOMING LINE SWITCH FUNCTION (column 1)

7.3.1. NORMAL OPERATION

MAIN INCOMING SWITCH ON- OFF COMMAND

The main switch can be commanded in the following mode by the selector switch and operators installed on the auxiliary command panel of the incoming column of the MCC.
(see picture below)



Selector switch 30SA1 "Manual-Automatic" function



- Manual position defines the switch command by Local command from the MCC
- Automatic position defines the switch command by the control relay REF 615.

Selector switch 30SA2 "Local-Remote" function

- Local position defines the command switch by the start/stop pushbutton installed on the command panel
- Remote position defines the command switch by the command from DCS Enppi

Local Operation sequences:

- Turn the selector switch 30SA1 in Manual position
- Turn the selector switch 30SA2 in Local position
- Press the pushbutton 30SB1 for "Close" command
- Press the pushbutton 30SB2 for "Open" command

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

Remote Operation sequences:

- Turn the selector switch 30SA1 in Automatic position
- Turn the selector switch 30SA2 in Remote position
- The command "Closed" from DCS command the closing of switch
- The command "Open" from DCS command the opening switch

Automatic Operation sequences:

- Turn the selector switch 30SA1 in Automatic position
- The "Close" command is generated from the relay REF 615
- The "Open" command is generated from the relay REF 615

7.3.2. POWER SUPPLY LOSS

The main incoming switch shall open due to under voltage protection (F27) controlled by protection relay REF615 (27A1)
The main switch of the feeder drawer shall remain closed
The main switch of the DOL drawer shall remain closed, motor contactor contactors shall open if under voltage continue more than 4.5 seconds.

7.3.3. POWER RESTORATION

The main incoming switch shall be closed in one of the way indicated in the point 1
Local, Remote or Automatic

If the motor contactor open, due to power loss for more than 4.5 seconds,) can be restarted manually from the local control station (Local Start/Stop) or from the DCS command (Start/Stop contact).
See point 8.3 DOL drawer

7.4.LVSWG MCC Columns

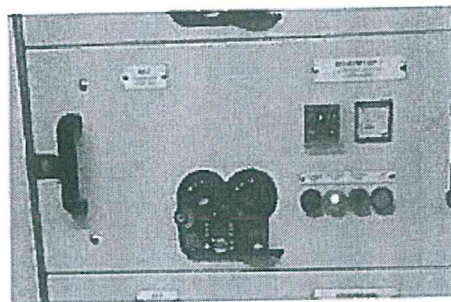
7.4.1. Drawer feeder commissioning/operating (column 2)

The drawer feeder column 2 is equipped with:

- Q.ty 5 Type F 4 poles drawers for feeder 100A
- Q.ty 1 Type F 3 poles drawers for feeder 63A

Front Drawer feeder type F (3 & 4 poles) see below picture



- PA80A Ammeter;
- 84SB1, Lamp Test blue push-button
- 84HL1, Green signal lamps (Circuit breaker open)
- 84HL2, Red signal lamps (Circuit breaker closed)
- 84HL3, Yellow signal lamps (Circuit breaker tripped on fault)
- 82A1, Residual current monitor






The feeders are connected according to the doc. 01251-100-S07-E10-0001

Test sequence

Check that the MCC is energized	<input checked="" type="checkbox"/>
Insert the drawer	<input checked="" type="checkbox"/>
✓ Check the correct function of the signal lamps by pushing the:	<input checked="" type="checkbox"/>
✓ 84SB1 Lamp test push button	<input checked="" type="checkbox"/>
✓ 84HL1, Green signal lamps (Circuit breaker open)	<input checked="" type="checkbox"/>
✓ 84HL2, Red signal lamps (Circuit breaker closed)	<input checked="" type="checkbox"/>
✓ 84HL3, Yellow signal lamps (Circuit breaker tripped)	<input checked="" type="checkbox"/>
✓ 82A1, Residual current monitoring check	<input checked="" type="checkbox"/>

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

Service sequence

Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch	
Remove the key from the left side rotary handle	
Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the feeder is now operating	

See attachment Lafer ME_CUB ITA ENG manual drawer operation

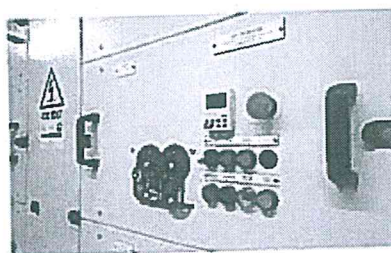
7.4.2. DOL drawer commissioning/operating (column 3 and 4)

The DOL drawer column 3 and 4 is equipped with



- Q.ty 4 Type M 3 poles drawers DOL motor starter > 7,5 kW and <75kW

Front DOL Drawer type M (3 poles) Motor starter > 7,5 Kw and <75kW see below picture

- 53SA1, TEST-OFF-REMOTE black selector switch with 3 maintained position.
- 53SB2, STOP red push-button
- 53SB3, START green push-button
- 55SB1, Lamp Test blue push-button
- 55HL1, Red signal lamps (RUN - MOTOR ON)
- 55HL2, Green signal lamps (STOP- MOTOR OFF)
- 55HL3, Yellow signal lamps (MOTOR FAULT)
- 53SB1, Mushroom Emergency stop push button



Motor starter drawer are connecting in according the doc. 01251-100-S07-E10-0001

	<p align="center"><u>EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</u></p>	
---	--	---

DOL motor starter is equipped with:

- QF50.1, LV moulded case circuit breaker
- UMC100.3 UC controller with UMC panel LCD DISPLAY



Test sequence

Check that the MCC is energized	<input checked="" type="checkbox"/>
Insert the drawer	<input checked="" type="checkbox"/>

<ul style="list-style-type: none"> ✓ Check the correct function of the signal lamps by pushing the: ✓ 55SB1 Lamp test push button ✓ 55HL1, Green signal lamps (Circuit breaker open) ✓ 55HL2, Red signal lamps (Circuit breaker closed) ✓ 55HL3, Yellow signal lamps (Circuit breaker tripped) 	<input checked="" type="checkbox"/>
---	-------------------------------------



<p>Turn in "TEST" position the selector switch 53SA1 to TEST the control circuit UMC100.3 (contactor closed → no power on the outgoing clamps)</p> <ul style="list-style-type: none"> ✓ Check the status of the UMC100.3 ✓ 55HL2, green lamp "ON" means contactor open (Motor off) ✓ 55HL1, red lamp "ON" means contactor closed (Motor on) ✓ 55HL3, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault 	<input checked="" type="checkbox"/>
---	-------------------------------------

<p>By the push button installed on the front of the drawer is possible to command the motor contactor:</p> <ul style="list-style-type: none"> ✓ 53SB1 Mushroom Stop pushbutton (emergency Stop) ✓ 53SB3 Start command ✓ 55HL1, red lamp "ON" means contactor closed (Motor on) ✓ 53SB2 Stop command ✓ 55HL2, green lamp "ON" means contactor open (Motor off) ✓ 55HL3, yellow lamp of reset pushbutton "ON" means main circuit breaker TRIP or UMC100.3 fault 	<input checked="" type="checkbox"/>
---	-------------------------------------

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

Remote sequence

<p>Push the little grey button sited on the left side of the drawer (as indicated by the relevant label "STARTING OPERETION) in order to let you insert the operating key into the incoming power connector switch rotary handle</p>	<input checked="" type="checkbox"/>
<p>Insert the key; press and rotate 180° clockwise to "I" position to insert the incoming power connector switch</p>	<input checked="" type="checkbox"/>
<p>Remove the key from the left side rotary handle</p>	<input checked="" type="checkbox"/>
<p>Insert the key in the right side rotary handle, press and rotate 90° clockwise to "I" position; the main incoming circuit breaker is closed and the unit is now operating</p>	<input checked="" type="checkbox"/>
<p>Turn in "REMOTE" position the selector switch 53SA1 to let command remotely the motor starter. The "REMOTE" position allows the command of the motor from a local pushbutton installed at site near the motor. The local pushbutton is equipped with:</p> <ul style="list-style-type: none"> ✓ 54SA1, 3 Position selector switch "HAND-0-AUTO" ✓ 54SB2, Start pushbutton ✓ 54SB1, Stop pushbutton <p>"Hand" position</p> <p>With the selector switch in "HAND" position the operator can start and stop the motor by a relevant Start and Stop pushbuttons installed on the local pushbutton. The start command is under the authorization from the DCS by digital contact "Permission" The stop command from DCS and the ESD stop are always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation</p> <p>"Auto" position command by DCS (star/stop digital contact)</p> <p>With the selector switch in "AUTO" position the start and stop command of the motor is controlled from DCS by a digital contact The stop command from DCS and the ESD stop are always in operation. The stop pushbutton is always in operation. Turning the selector switch 54SA1 on the local pushbutton in "0" position the motor stop The mushroom Stop pushbutton on the drawer (emergency Stop) is always in operation</p>	

	<p align="center">EGPC – THE EGYPTIAN GENERAL PETROLEUM CORPORATION.</p>	
---	---	---

6 FINAL CERTIFICATION

After SAT completion, check that all related documents are red marked up for future revision, fully fill-in, properly signed and traced with relevant attachments.

ACCEPTANCE CERTIFICATE		
<p>THE UNDERSIGNED HAS INSPECTED AND PERFORMED SELECTED TESTS WITHIN THIS DOCUMENT AND ACCEPTS THAT THE PRODUCED UNDER THE</p>		
<p>P.O.: DATED:</p>		
<p>HAS BEEN TESTED AS PER SPECIFICATION AND MEETS THE REQUIREMENTS OF CLIENT</p>		
<p><u>Ali Ashraf</u> FOR CONTRACTOR</p>	<p><u>Mohamed omar</u> FOR CLIENT</p>	<p><u>Dion/L</u> FOR VENDOR</p>
<p><u>10/7/2021</u> DATE</p>		



**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.**



7 FINAL TEST REPORT

DATE 30/10/2020	REVISION 0	PAGE 1 of 1			
TEST REPORT					
OBJECT OF THE TEST: COMMISSIONING SAT TEST _____ TAG EPM 030-EPM-04					
REFERENCE DOC: INSPECTION & TEST PLAN 01251-100-S07-P12-0007 SAT F&G 01251-100-S07-P06-0006					
LEGEND: NA: Not Applicable P: Pending S: Satisfactory					
FIRE DETECTION AND ALARM SYSTEM					
POS	DESCRIPTION	SAT			PENDING N°
		NA	P	S	
A.1	Visual and dimensional check			✓	
A.2	Wiring insulation and continuity test			✓	
4.1	Workmanship Material, Surface defects, components and general finish			✓	
4.2	Mark tagging and conformance to packing requirements			✓	
4.3	Hardware functionality			✓	
4.4	Software functionality			✓	
4.5	Site acceptance integration test			✓	
4.6	Power supply interruption test			✓	
Enppi Representative Al: Ashraf		Gear Representative SAFETEC S.r.l.		Date 10/7/2021	
REMARKS					

Enppi**EGPC – THE EGYPTIAN GENERAL
PETROLEUM CORPORATION.****Enppi**DATE
30/10/2020REVISION
0PAGE
1 of 1**TEST REPORT**

OBJECT OF THE TEST:

COMMISSIONING SAT TEST TAG EPM DBO-EPM-04

REFERENCE DOC:

INSPECTION & TEST PLAN 01251-100-S07-P12-0007

SAT F&G 01251-100-S07-P06-0006

LEGEND:

NA: Not Applicable

P: Pending

S: Satisfactory

FIRE FIGHTING SYSTEM

POS	DESCRIPTION	SAT			PENDING N°
		NA	P	S	
B.1	Visual and dimensional check			✓	
5.1	Workmanship Material, Surface defects, components and general finish			✓	
5.2	Mark tagging and conformance to packing requirements			✓	
5.3	Pneumatic test			✓	
5.4	Leakage test for storage cylinders			✓	
5.5	Operation / pressure test (manifold pressure switch)			✓	
5.6	Electrical control head and components wiring check			✓	
5.7	Simulation test			✓	
5.7	Room Integrity test		✓		

Enppi Representative

Ali Ashraf

Cear Representative

SAFETY S.R.L.

Date

10/17/2021

REMARKS

Room integrity test was done to the LV room only and the transformer room is remaining



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.10- Electrical Pre-Commissioning Check Lists

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Prijct, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : P-030-EPM4-UPDP-1



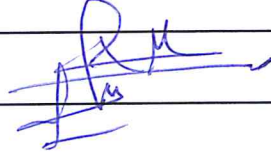
AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Priject, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : P-030-EPM4-UPDP-1


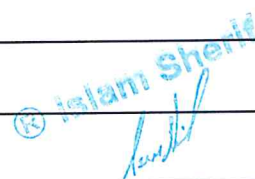
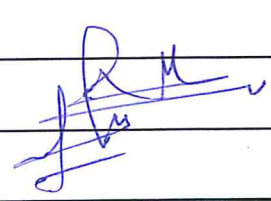
AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Trench markers to be checked w.r.t approved documents.	✓	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	✓	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	✓	
16	Equipment test report and inspection certificate to be-checked.	✓	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Priject, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : C-030-EPM4-LVSWG

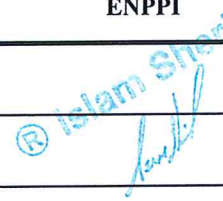

AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Piject, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : C-030-EPM4-LVSWG

AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Trench markers to be checked w.r.t approved documents.	✓	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	✓	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	✓	
16	Equipment test report and inspection certificate to be-checked.	✓	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE	Sobh	Islam Sherif	[Signature]
DATE			



**PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES
EL-31 A**

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Priject, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : P-030-EPM4-TR-1

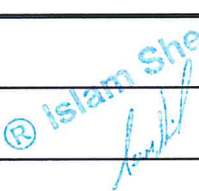
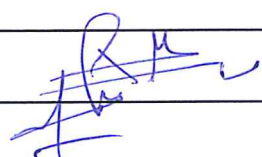
AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Construction punch list to be checked.	✓	
2	Check cables are correctly fixed to trays and supports.	✓	
3	Check cables through walls or ceilings are correctly sealed.	✓	
4	Check that all cables are installed in accordance with cable lists and approved documents.	✓	
5	Check identification tags of all conductors and wires.	✓	
6	Check connection, termination and joints of cables are correctly executed.	✓	
7	Inspect cables for jacket damage.	✓	
8	Ensure that the correct size and type of crimping lugs have been used.	✓	
9	Check that the bending radius of cables is not less than the minimum established.	✓	
10	Cable markers to be installed before covering buried cables or cables in cable trays.	✓	
11	Tie wraps to be used for cable and wires fixation.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST MEDIUM VOLTAGE CABLES EL-31 A

PROJECT TITLE : EDPCCrude Oil Tank Farms Priject, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Electrical

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : P-030-EPM4-TR-1

AREA : 30

REF. DWGs/DOCs :

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Trench markers to be checked w.r.t approved documents.	—	
13	Check cable glands for tightness and check the correct type of gland has been used for the size and type of installed cables.	—	
14	Inspect cable laid in trenches, segregation and protection.	✓	
15	Cables to be tested (continuity/insulation resistance).(*)	—	
16	Equipment test report and inspection certificate to be-checked.	—	
17	Check availability of vendor documents, including commissioning and start-up instructions. (If Any)	N/A	
18	Calibration test certificate of testing equipment to be checked.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	CONST. CONTRACTOR	ENPPI	CUSTOMER
NAME			
SIGNATURE	Sobh	® Islami Sherif	R M
DATE			



**PRE-COMMISSIONING CHECK LIST
MEDIUM VOLTAGE CABLES**

EL-31 A

INSULATION TEST

EL-31 A

CABLE VOLTAGE LEVEL	D.C TEST VOLTAGE	MINIMUM INSULATION RESISTANCE (M.OHMS).
3.3kV	2500V	200
6.6kV & Above	5000V	200

TABLE [I]

NOTES:

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Loss Prevention

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : 030XA047



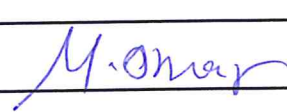
AREA : 30

REF. DWGs/DOCs : 030XA047

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



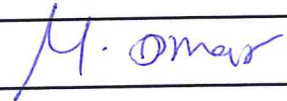
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	DISCIPLINE : Loss Prevention
SYSTEM NAME : Electrical Power Module-4 System	SYSTEM ID : 030-EL-020
SUB-SYSTEM NAME : Electrical Power Module-4 System	SUB-SYSTEM ID : 030-EL-020
ITEM TAG No. : 030XA047	AREA : 30
REF. DWGs/DOCs : 030XA047	

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Loss Prevention

SYSTEM NAME : Electrical Power Module-4 System

SYSTEM ID : 030-EL-020

SUB-SYSTEM NAME : Electrical Power Module-4 System

SUB-SYSTEM ID : 030-EL-020

ITEM TAG No. : 030XA048

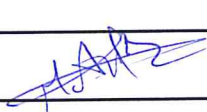

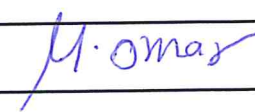
AREA : 30

REF. DWGs/DOCs : 030XA048

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	NA	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Loss Prevention

SYSTEM NAME :Electrical Power Module-4 System

SYSTEM ID :030-EL-020

SUB-SYSTEM NAME :Electrical Power Module-4 System

SUB-SYSTEM ID :030-EL-020

ITEM TAG No. :030XA048

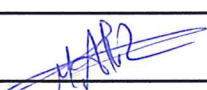
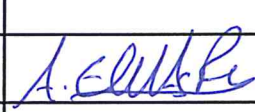
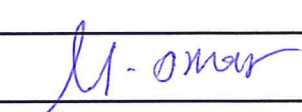
AREA : 30

REF. DWGs/DOCs :030XA048

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



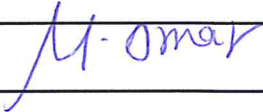
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	DISCIPLINE : Loss Prevention
SYSTEM NAME : Electrical Power Module-4 System	SYSTEM ID : 030-EL-020
SUB-SYSTEM NAME : Electrical Power Module-4 System	SUB-SYSTEM ID : 030-EL-020
ITEM TAG No. : 030XA049	AREA : 30
REF. DWGs/DOCs : 030XA049	

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



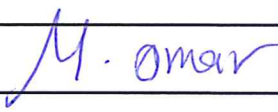
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	DISCIPLINE : Loss Prevention
SYSTEM NAME :Electrical Power Module-4 System	SYSTEM ID :030-EL-020
SUB-SYSTEM NAME :Electrical Power Module-4 System	SUB-SYSTEM ID :030-EL-020
ITEM TAG No. :030XA049	AREA : 30
REF. DWGs/DOCs :030XA049	

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



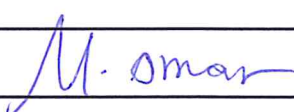
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A



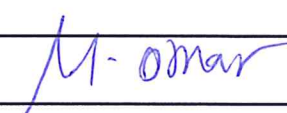
PROJECT TITLE	: EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)		
PROJECT NUMBER	: 1251-100	DISCIPLINE	: Loss Prevention
SYSTEM NAME	: Electrical Power Module-4 System	SYSTEM ID	: 030-EL-020
SUB-SYSTEM NAME	: Electrical Power Module-4 System	SUB-SYSTEM ID	: 030-EL-020
ITEM TAG No.	: 030XA050	AREA	: 30
REF. DWGs/DOCs	: 030XA050		

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A			
PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)			
PROJECT NUMBER : 1251-100		DISCIPLINE : Loss Prevention	
SYSTEM NAME :Electrical Power Module-4 System		SYSTEM ID :030-EL-020	
SUB-SYSTEM NAME :Electrical Power Module-4 System		SUB-SYSTEM ID :030-EL-020	
ITEM TAG No. :030XA050		AREA : 30	
REF. DWGs/DOCs :030XA050			
No.	DESCRIPTION	RESULT OK/NA/PL	PL ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	
REMARKS AND OBSERVATIONS : <div style="height: 40px; border: 1px solid black;"></div>			
OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.			
COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

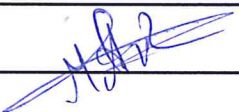

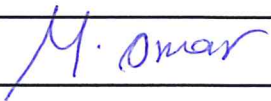
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	DISCIPLINE : Loss Prevention
SYSTEM NAME : Electrical Power Module-4 System	SYSTEM ID : 030-EL-020
SUB-SYSTEM NAME : Electrical Power Module-4 System	SUB-SYSTEM ID : 030-EL-020
ITEM TAG No. : 030XA051	AREA : 30
REF. DWGs/DOCs : 030XA051	

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Loss Prevention

SYSTEM NAME :Electrical Power Module-4 System

SYSTEM ID :030-EL-020

SUB-SYSTEM NAME :Electrical Power Module-4 System

SUB-SYSTEM ID :030-EL-020

ITEM TAG No. :030XA051



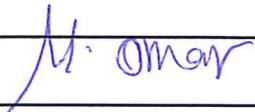
AREA : 30

REF. DWGs/DOCs :030XA051

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



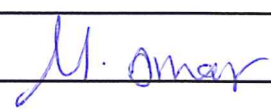
PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)	
PROJECT NUMBER : 1251-100	DISCIPLINE : Loss Prevention
SYSTEM NAME : Electrical Power Module-4 System	SYSTEM ID : 030-EL-020
SUB-SYSTEM NAME : Electrical Power Module-4 System	SUB-SYSTEM ID : 030-EL-020
ITEM TAG No. : 030XA052	AREA : 30
REF. DWGs/DOCs : 030XA052	

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
1	Check that the piping is installed as per design drawings. i.e. length, size,...etc	NA	
2	Check that the nozzle is properly oriented.	NA	
3	Check that the detection device is in proper location.	NA	
4	Check that the detection device model number as per data sheet.	NA	
5	Check the manual station is properly installed and accessible.	NA	
6	Check all detectors and devices with proper tags.	NA	
7	Check the abort switch is deadman type.	NA	
8	Check that the control unit is properly installed.	✓	
9	Check the control panel wiring termination as per supplier drawings.	✓	
10	Check the control panel is properly identified.	✓	
11	Check the agent container location in correct position.	NA	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			

PRE-COMMISSIONING CHECK LIST GASEOUS FIRE EXTINGUISHING SYSTEM LP-05 A

PROJECT TITLE : EGPC Crude Oil Tank Farms Project, Agrood Area 30 (Module-01)

PROJECT NUMBER : 1251-100

DISCIPLINE : Loss Prevention

SYSTEM NAME :Electrical Power Module-4 System

SYSTEM ID :030-EL-020

SUB-SYSTEM NAME :Electrical Power Module-4 System

SUB-SYSTEM ID :030-EL-020

ITEM TAG No. :030XA052



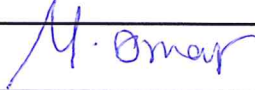
AREA : 30

REF. DWGs/DOCs :030XA052

No.	DESCRIPTION	RESULT	PL
		OK/NA/PL	ITEM No.
12	Check the agent container are fastened.	NA	
13	Check the container filling arrow pointed to green area.	NA	
14	Check the non return valve orientation.	NA	
15	Check the flexible hose installation.	NA	
16	Check the abort switch is deadman type.	NA	
17	Check wiring is properly installed as per drawing.	✓	
18	Check the power supplied for control unit from separate dedicated source.	✓	

REMARKS AND OBSERVATIONS :

OK: NO OBJECTION, NA: NOT APPLICABLE, PL: PUNCH LIST.

COMPANY	PETROJET	ENPPI	PPC
NAME			
SIGNATURE			
DATE			



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

12.11- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

13- Electrical Commissioning



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

13.01- Electrical -Commissioning Check Lists



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

13.02- Electrical Supplier Check Lists & Reports



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

14- Red Marked-up Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

14.01- P&ID

System ID	030-EL-020
System Description	Electrical Power Module-4 System

14.02- Instrumentation Drawings



Project: 01251-100
CRUDE OIL TANK FARM PROJECT (AGROOD AREA)



System ID	030-EL-020
System Description	Electrical Power Module-4 System

14.03- Electrical Drawings